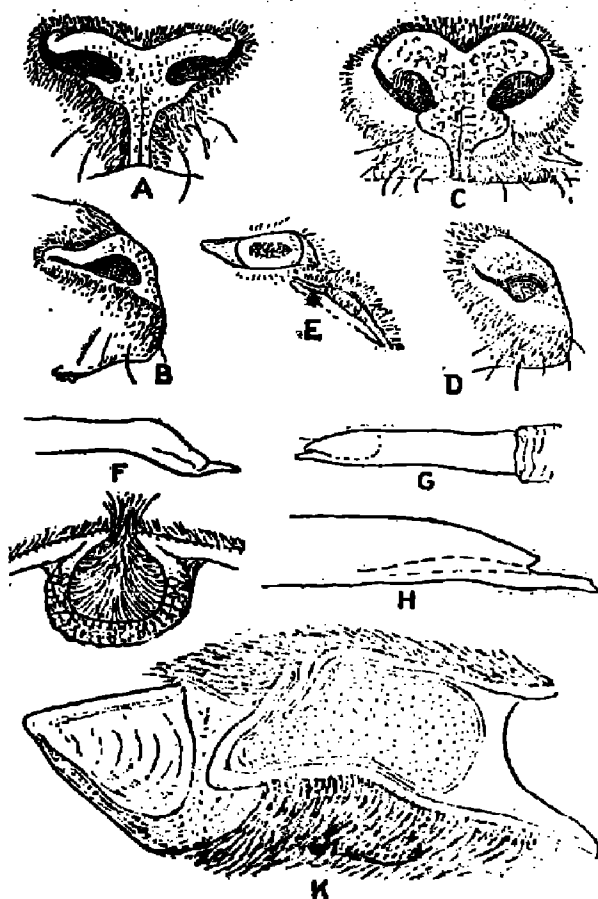


Fig. 2.



- A. Rhinarium of *Rupicapra rupicapra* from the front, $\times \frac{1}{2}$.
- B. The same from the side.
- C. The same of *Nannokhedus goral* from the front, $\times \frac{1}{2}$.
- D. The same from the side.
- E. The eye and preorbital gland of *Nannokhedus goral*, the gland in section showing the thickened integument overgrown with hairs, holding secretion at their bases.
- F. Extremity of penis of *Rupicapra rupicapra*.
- G. The same of *Nannokhedus goral*.
- H. The same of *Bustanus tataricus*.
- I. Section of preorbital gland of *Capricornis thar*.
- K. Section of fore foot of the same, showing the large interdigital gland with its small orifice.

race, named *C. thar jamrachi*, which was then living in the Society's Gardens. The death of the animal in July 1913 enabled me to make a detailed examination of these glands.

The *preorbital gland* (fig. 2, I) consists of a comparatively deep, thick-walled, nearly spherical sack, the cavity of which is absolutely packed with long hairs, growing nearly vertically from its walls and protruding as a tuft from the small, circular, non-valvular orifice.

The *pedal glands* (fig. 2, K), alike on the front and hind legs, open by a small circular orifice on the front of the pastern at the summit of the interdigital cleft exactly as in *Ovis* and *Nemorhedus*, and, as in these genera, the orifice leads into a well-defined cylindrical tube or duct. But, whereas in *Ovis* and *Nemorhedus* this duct gradually passes into a comparatively small saccular portion of the gland bent upon the duct at an acute angle, in *Capricornis* the duct communicates abruptly with an immense saccular gland which occupies the entire space, bounded laterally by the bones of the feet and above and below by the anterior and posterior integument of the pastern. Inferiorly the sack reaches into the angle formed by the fold of integument constituting the heel-tie, and above it extends almost up to a point on a level with the upper edge of the false hoofs. The cavity of the sack was sparsely hairy and filled with brownish-yellow secretion.

So closely are the walls of the glandular sack applied to the integument of the pastern, that I am convinced the explanation of my failure to detect the gland in the dried skin of *C. argyrochætes*, mentioned on p. 855 of my previous paper, lies in the occurrence of a similar condition in that species. Hence the idea I then provisionally entertained, that possibly that species has no pedal glands, may be finally dismissed.

I am unable to find any justification for Lydekker's opinion that the various forms of *Capricornis* should be referred to two species, *C. sumatraensis*, comprising nine subspecies ranging from Kashmir to Sumatra and an unknown number from China, and *C. argyrochætes* from Kansu and Szechuan in China. The latter does not differ so much from some of the subspecies of *C. sumatraensis* as some of the latter differ from each other. In the present state of our knowledge it appears to me that the only courses open to us are to regard these forms as local races of one species, the course I adopted, or as so many distinct species—a course which I prefer to leave to him who has

the time and leisure to discover and define the characters to which specific rank may be assigned.

Genus *CAPRICORNULUS*, Heude.

Capricornulus crispus, Temm. (p. 855).

Heude separated this species of serow from *Capricornis* as a distinct genus *Capricornulus*, which Lydekker and I adopted as a subgenus. But it appears to me that the discovery of the structure of the pedal glands in *Capricornis* throws a different complexion on the question.

In 1910 I figured and described the pedal glands of *Capricornulus crispus*, and pointed out that they resemble in all respects those of *Nemorhedus*. Moreover, the discovery of the presence of preorbital glands in *Nemorhedus* (cf. *infra*) lessens the differences between that genus and *Capricornis*, and results in the occupation by *C. crispus* of a position intermediate between the two so far as cutaneous glands are concerned, the pedal glands resembling those of *Nemorhedus* and the preorbital glands those of *Capricornis*.

Genus *NEMORHEDUS*, H. Smith.

In 1910 my examination of material of this genus was limited to dried skins of *N. goral* and *N. raddeanus*. Since that date I have seen a fresh adult male example of the former species, which enables me to amplify and, in one particular, to correct my previous observations.

Nemorhedus goral, Harl. (p. 853).

A male example from Chamba, presented by Major Rodon in 1904, which died Nov. 4th, 1915.

The *preorbital gland* was declared to be absent in this genus by Owen, Hodgson, and Ogilby. That statement, which I accepted, proves to be untrue, strictly speaking, although the gland is so small as to account for its being overlooked on dried skins or even on fresh material. Externally the gland is marked by a very small patch of nearly naked skin covered with dry scurf-like secretion. There is no invagination of the integument, but beneath the patch of bare epidermis, the dermis is thickened and glandular (fig. 2, E). The gland, although relatively smaller, may be compared in its development to that of

Adenota kob or *Hippotragus niger*; but whether it represents a rudimentary or vestigial condition of the pouch-like preorbital gland of *Capricornis* must be left an open question.

The *pedal glands* and the structure of the feet resemble in every respect those of *N. raddeanus*, described and figured on p. 854 of my previous paper. *Inguinal glands*, as noticed in 1910, are absent.

The *rhinarium* (fig. 2, C, D) is large and naked on its upper surface almost as far back as the posterior angle of the nostril, but in the middle line above, the hair grows forwards, forming an angular point. Beneath the nostril laterally there is a comparatively wide area of smooth naked skin. In front the rhinarium extends to the edge of the upper lip as a narrow grooved strip of corrugated integument which expands above to right and left beneath the inner angle of the nostrils, and the expanded portion is flanked on each side by an area of smooth naked skin.

The *penis* (fig. 2, G) is cylindrical, slightly expanded distally, then gradually narrowed to the apex, beyond which the end of the urethral canal is prolonged as a tube for a short distance.

Two points of special interest may be noticed in connection with these observations: namely, the similarity of the penis to that of *Budorcas*, described below, and the presence of the preorbital gland, which serves to link *Nemorhedus* closer with *Capricornis* than was previously supposed to be the case.

Genus *BUDORCAS*, Hodgson.

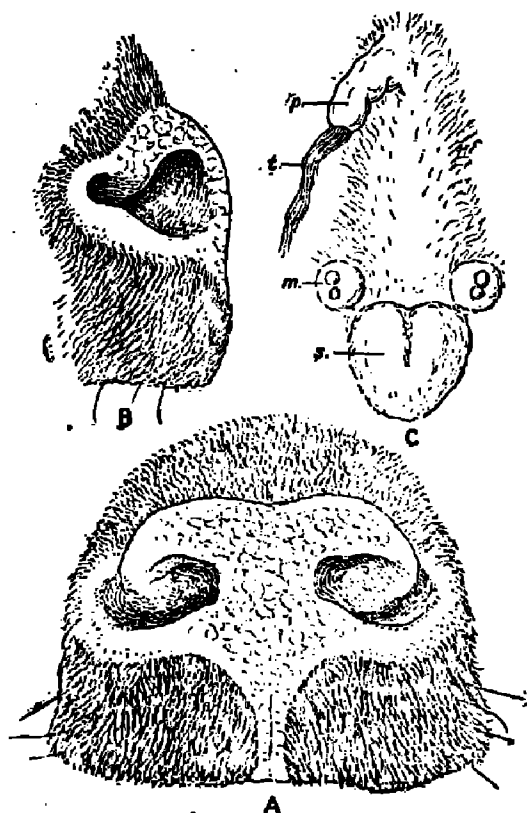
Budorcas taxicolor, Hodgson (p. 856).

The death of a male example of this species from N.W. Bhotan enables me to verify and extend my account of the external characters of this genus published in 1910, and based partly on this example when alive and partly upon a dried skin of *B. taxicolor tibetanus* lent to me by Mr. Gerrard.

The *rhinarium* (fig. 3, A, B) is continued inferiorly to the edge of the upper lip as a narrow mesially grooved strip, which is longer than in *Nemorhedus* owing to the greater depth of the upper lip. Laterally an area of naked skin, narrower than in *Nemorhedus*, is continued with a bold curve beneath the widely expanded nostrils, and curving round their posterior extremities passes into the dorsal

portion of the rhinarium, which is much shorter from before backwards than in *Nemorhedus*, being considerably more overgrown with hair.

Fig. 3.



- A. Muzzle of *Budorcas tataricus* from the front, $\times 4$.
 B. The same from the side.
 C. Genital area of *Budorcas tataricus*. p., pendulous extremity of penis;
 t., long tuft of hair protruding from the prepuce; m., mammary
 arising from glandular elevation; s., scrotum.

The feet resemble in essential particulars those of the dried example figured in 1910 (p. 852) and described (p. 856), except that on the fore foot there is no trace of the

transverse ridge of integument just where the hair of the pastern ceases in the interungual space. There is no trace of definite pedal gland, although the hair at the bottom of the interdigital depression in front is stuck together with secretion, indicating activity of the skin at that spot. The hind foot is like the front foot.

There is no trace of *preorbital gland* or of *inguinal glands* in the ordinary sense of that term; but the two mammae (fig. 3, C, m.) on each side, set as far out from the middle line as the outer edge of the scrotum, are close together, one in front of the other, in the centre of a distinct swelling like a small udder. When the skin is cut away, this swelling is seen to be caused by a blackish glandular mass like a small bunch of grapes, and blackish secretion could be squeezed through a single pore on the posterior teat with the use of considerable pressure. This unusual condition of the mammary gland in the male is worth putting on record, although, pending the examination of other specimens of *Budorcas*, it must be regarded, I think, as pathological in one individual.

The *penis* (fig. 3, C, p.) is provided with a pendulous prepuce, three inches long, rising from the abdomen six inches in front of the scrotum. Just within the orifice of the prepuce the skin is highly glandular and overgrown with long hairs, which protrude from the aperture to form a tuft three or four inches long. The *glans penis* (fig. 2, H) is apically attenuated and provided with a straight, moderately stout, urethral prolongation projecting some little way beyond the tip of the glans. Except for the greater elongation of the free portion of the urethral canal, the *glans penis* is very like that of *Nemorhedus*.

One of the chief interests connected with *Budorcas* is involved in the claim that the genus is related to *Oribos*, whose uncertain position in the Bovidae was expressed by Lönnberg's ascription of it to a special subfamily *Ovibovinae* (Proc. Zool. Soc. 1900, pp. 142-167). Judging from the characters dealt with in this paper it does not appear to me that the claim of close relationship between the two forms can be maintained, and I am disposed to regard the resemblances between them in horn-growth, robustness of build, etc., as independently acquired. The differences between them may be tabulated as follows. For most of the characters relating to *Oribos* I am indebted to Lönnberg's paper:—

Budorcas, ad. ♂.

Rhinarium well developed, about 14 mm. deep above the nostrils, 20 mm. wide between them, and extended beneath them as a naked strip of skin and passing inferiorly to the edge of the upper lip as a mesially grooved band (*philtrum*) about 7 mm. wide.

Preorbital gland absent.

Hoofs narrower, more pointed in front, integument between them naked.

Mammæ 4, the anterior and posterior on each side almost in contact, but very widely separated from those of the opposite side, the four together arranged in a transverse oblong about five times as wide as long.

Prepuce distally pendulous, distal portion of its cavity not provided with longitudinal ridges, but thickly beset with coarse long hairs protruding at all seasons some 4 inches from the orifice as a long tuft.

Glans penis markedly attenuated at the apex, the urethral canal prolonged for a considerable distance beyond the tip.

Oribos, ad. ♂.

Rhinarium greatly reduced, about 8 mm. deep above the nostrils and only a little more between them, not extending beneath them and not continued inferiorly to the edge of the upper lip.

Preorbital gland present, invaginated.

Hoofs broad, wide in front, integument between them thickly hairy except for the naked heel-tie.

Mammæ 4, arranged so as to form the normal four-sided figure, which is only a little wider than long, the anterior being separated from the posterior on each side by a considerable space.

Prepuce distally pendulous, distal portion of its cavity provided with longitudinal folds and clothed with fine hairs only in the winter, but these do not form a long protruding tuft.

Glans penis blunt at the end, the urethral canal not extending beyond its tip.

But although the differences above tabulated exclude the idea of relationship between *Budorcas* and *Oribos*, sufficiently intimate to warrant the removal of *Budorcas* from the Rupicaprine, as now understood, and its association with *Oribos* in a special subfamily, they by no means justify the conviction that *Oribos* is not a specialised Rupicaprine. The description, for example, of the preorbital gland applies to that of *Capricornis* or *Capricornulus*, and the termination of the urethral canal in *Nemorhedus* is nearly intermediate in development between those of *Budorcas* and *Oribos*; the arrangement of the mammæ is normal for the Ruminantia, as a whole, including the typical Rupicaprine; the structure of the feet may be easily derived in imagination from that of *Oreamnos* or even of *Nemorhedus*, in which the gland has reached the retort-like stage, which in the Caprine precedes its total suppression, as attested by *Ovis* and *Capra*, and the reduction of the rhinarium in *Oribos* is foreshadowed

in *Rupicapra*, except for the total suppression of the *philtrum*. In this respect *Ovis* is highly specialised and unique, so far as its possible allies are concerned.

On the evidence before me, I consider that if the *Ovis* bovinæ be maintained as a special subfamily of Bovidae, the Rupicaprinæ, as at present understood, should be split up into three subfamilies, the Rupicaprinæ for *Rupicapra* and *Oreamnos*, the Næmorhedinæ for *Næmorhedus*, *Capricornulus*, and *Capricornis*, and the Budorcinæ for *Budorcas*. But if the conservative course of maintaining the Rupicaprinæ in its recognised comprehensive sense be followed, then *Ovis* should, I think, be one of the genera of this somewhat heterogeneous assemblage.

Subfamily CAPRINÆ.

Genus *Ovis*, Linn.

Ovis musimon, Schr., and *O. vignei*, Blyth (pp. 859-861).

Since 1910 I have examined representatives of the two species previously recorded, namely *Ovis vignei* and *O. musimon*, without finding anything to add or alterations to make to my previous description of the cutaneous glands, except to remark that in the case of *O. musimon* the naked condition of the interungual integument noticed in one specimen is quite exceptional, and that as a very general rule that species and *O. vignei* are alike with respect to the hairiness of the area in question. Possibly the variation noticed is seasonal, as appears to be the case in *Ammotragus lervia*.

The *rhinarium* of *O. vignei* is quite characteristic of the genus. It extends as a narrow bar above the nostrils almost back to their posterior termination, the internarial septum is narrow, the area beneath the septum is a little expanded, and a narrow *philtrum* cleaves the upper lip, but there is no naked area of skin bordering the nostrils below.

The *penis* of *O. vignei* (fig. 4, D), as in *O. aries*, ends in a blunt gland-like enlargement, bent downwards distally. From its underside the very long filiform termination of the urethral canal arises, and passes forward on the left side of the glandular thickening.

Genus *Pseudois*, Hodgson.

Pseudois nayaur, Hodgson. (p. 863).

Specimens examined since 1910 confirm in every respect

the constancy of the characters upon which I separated this species from *Ovis*—namely, the suppression of the preorbital, inguinal, and pedal glands.

The *rhinarium* (fig. 4, F, G) resembles in a general way that of *Ovis vignei*, but the nostrils are more dilatable and the "philtrum" less well defined, hardly a trace of it remaining. In one specimen the hairs of the upper lip are only separated by a very narrow parting, which is completely overlapped and concealed by the hairs to the right and left of it.

The naked underside of the tail (fig. 4, II) is marked on each side above the anus with a wide and moderately deep glandular depression, corresponding with the subcaudal gland of *Capra*, but smaller.

The glandular portion of the end of the *penis* (fig. 4, B) is longer and straighter than in *Ovis vignei*, but the filiform termination of the urethra is approximately as long as in that species, and much longer than in the following genera. The length of this tube and the absence of strong "Caprine" smell in the male are two points in which *Pseudois* comes nearer *Ovis* than *Capra*. In the suppression of the specialised cutaneous glands *Pseudois* is Caprine and not Ovine.

Genus *AMMOTRAGUS*, Blyth.

Ammotragus lervia, Pall. (p. 862).

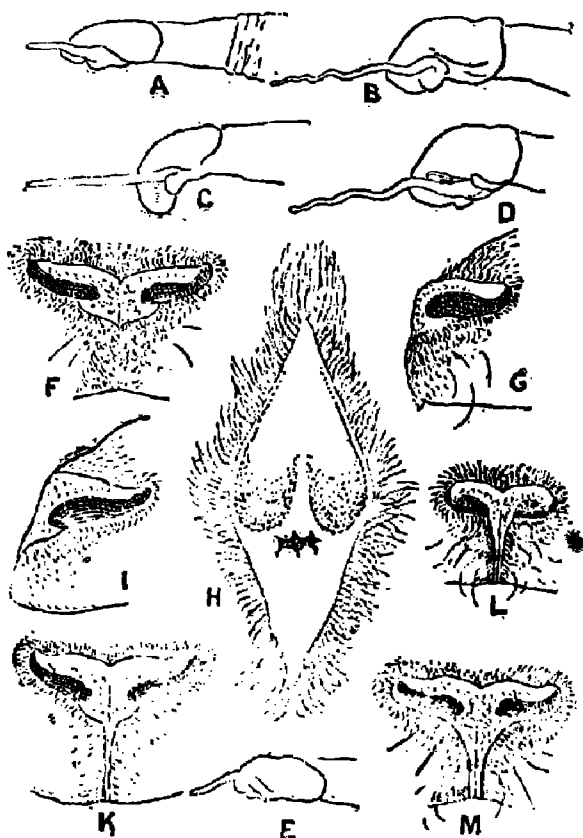
My notes upon this species, published in 1910, were taken from the examination of a living specimen. Several dead examples that have passed through my hands since that date confirm in every respect the statement then made as to the absence of the preorbital, inguinal, and pedal glands.

A peculiarity I drew attention to in 1910—namely, the smoothness of the interdigital depression in the example examined—proves to be inconstant, although the hairs of this area when developed are not so long as in *Ovis* and *Pseudois*. Possibly the variation is seasonal. For instance, in a specimen (♂) that died on Nov. 11th, the interdigital cleft was clothed with short hairs down to the heel-tie, as is normal in the Caprine series. In a second that died on March 5th, the interdigital cleft was naked. A third, which died on Feb. 10th, exhibited a condition intermediate between those of the other two. In the newly born young the space is covered with hair.

The *rhinarium* (fig. 4, M) presents no features of special

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Fig. 4.



- A. Extremity of penis of *Hemitragus jemlaicus*.
 B. The same of *Pseudos nayaaur*.
 C. The same of *Anomotragus lervia*.
 D. The same of *Ovis rignei*.
 E. The same of *Cupra cyagnus*.
 F. Rhinarium of *Pseudos nayaaur*, showing absence of philtrum, $\times \frac{1}{2}$.
 G. The same from the side.
 H. Lower side of base of tail of *Pseudos nayaaur*, showing the pair of glandular depressions above the anus.
 I. Rhinarium of *Hemitragus jemlaicus* from the side, $\times \frac{1}{2}$.
 K. The same from the front.
 L. The same of *Cupra cyagnus*, $\times \frac{1}{2}$.
 M. The same of *Anomotragus lervia*, $\times \frac{1}{2}$.

THE ANNALS
AND
MAGAZINE OF NATURAL HISTORY.
[NINTH SERIES.]

No. 8. AUGUST 1918.

X.—On some External Characters of Ruminant Artiodactyla.
—Part II. The Antilopinae, Rupicaprinae, and Caprinae,
with a Note on the Penis of the Cephalophinae and Neotraginae. By R. I. Pocock, F.R.S.

THE first part of this series of papers, supplementary to the account of the "Cutaneous Glands of Ruminants" published in 1910 (Proc. Zool. Soc. pp. 840-986), was issued in the Ann. & Mag. Nat. Hist. for June of this year, pp. 426-435. It dealt with the Cephalophinae, Neotraginae, Oreotraginae, and Madoquinae. The present communication comprises the Antilopinae, Rupicaprinae, and Caprinae, the most interesting forms described being the two Rupicaprine genera *Cupricornis* and *Budorcas*, of which I had only defective material for examination in 1910.

As in the previous paper, the pagination inserted after generic and specific names refers to the original treatise published in 1910.

Subfamily *ANTILOPINÆ*.

Genus *GAZELLA*, Licht.

In 1910 (P. Z. S. pp. 887-893) I described the preorbital, angular, pedal, and carpal or knee-glands in the following species of this genus:—*G. bennettii*, *subgutturosa*, *marica*, *nuscatensis*, *dorcas*, *pelzelni*, *cuvieri*, *rufifrons*, and *sæmmeingii*. My descriptions were based upon fresh examples of all

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interest, being typically Ovine or Caprine in structure, with the narrow "philtrum" well developed.

There is a well-marked *subcaudal gland* above the anus as in *Pseudois*.

The gland-like termination of the *penis* (fig. 4, C) is very like that of *Ovis vignei* in shape and curvature, but the filiform termination of the urethra is a little shorter than in that species.

According to Lydekker, the males of this animal are not malodorous (Cat. Ungulates, i. p. 123). That is quite untrue. The males have a very decidedly goaty odour in the breeding season. It is also untrue that the typical race of this species is distinguished by "an indistinct median face stripe." A pair imported from Morocco and exhibited in the Gardens a few years ago showed no trace of such a stripe.

Genus *CAPRA*, Linn. (p. 864).

I have nothing to add to what I said in 1910 regarding the suppression of the preorbital, pedal, and inguinal glands in various species of this genus.

The *rhinarium* conforms in type to that of *Ovis* and *Ammotragus*, the "philtrum" being better defined than in *Pseudois*. In an example of *C. agagrus* from Crete, I found the supranarial extension of the rhinarium (fig. 4, L) larger than in most examples of domesticated goats: but this varies to a certain degree in the latter, as also does the width of the naked area of skin beneath the nostrils laterally.

The *subcaudal gland* was a deeper pocket than those observed in *Ammotragus* and *Pseudois*.

The *penis* (fig. 4, E) also is constructed very much as in those genera, and has a well-defined, but rather short, glandular termination, which, on the right side, as in the other genera, curls beneath the tubular filiform termination of the urethra, which is shorter than in *Ovis*, *Ammotragus*, and *Pseudois*.

Genus *HEMITRAGUS*, Hodgson.

Hemitragus jerdoni, Hodgs. (p. 866).

Additional specimens confirm my previous statements with regard to the suppression of the preorbital, inguinal, and pedal glands.

Hodgson's assertion that the *rhinarium* (fig. 4, I, K) is larger in *Hemitragus* than in *Capra* is perfectly true. The supranarial extension is considerably deeper, and, similarly,

144. *External Characters of Ruminant Artiodactyla.*

the extension beneath the inner angles of the nostrils in front is wider.

In the penis (fig. 4, A) the glandular termination is more elongate and less bulbous than in *Capra* and the filiform termination of the urethra is shorter. It is the shortest, indeed, that is found within the limits of the Caprinæ.

The subcaudal gland is represented externally by a shallow depression above and at the sides of the anus.

Note on the Penis of the Cephalophinæ and Neotraginæ.

In my paper published in the issue of this Journal for June 1918, I regret that I overlooked at the time Lönnberg's descriptions and figures of the penis of *Cephalophus natalensis* and of *Sylvicapra grimmia* (Ark. Zool. Stockholm, (5) v. no. 10, pp. 2-3, figs. 1-2, 1909). He shows that in *C. natalensis* the urethral canal has a very long filiform prolongation resembling that of *Guerrei maxwelli* figured by Garrod (P. Z. S. 1877, p. 10, fig. 20), whereas in *S. grimmia* the tubular prolongation is quite short, only overlapping the glans to a small extent. Now, *C. natalensis* is so closely related to *C. dorsalis* as hardly to admit of a doubt as to identity in the structure of the penis in the two species. In that case the penis of *C. dorsalis* I described as being without the tubular urethral prolongation must have been defective, owing to mutilation. Lönnberg's observations show that *Cephalophus* differs from *Sylvicapra* not by the suppression of the urethral prolongation, as I stated, but by its development and length, which affiliate the former genus with *Guerrei*.

In the case of the Neotraginæ, it may be recalled that Garrod (*op. cit.* p. 11, fig. 21) described the penis of *Ourebia nigricaudata* as possessing a long slender urethral prolongation considerably overlapping the slender tip of the glans penis, whereas, according to Lönnberg's observations (*op. cit.* p. 4, figs. 3-4), the urethra does not surpass the tip of the glans in *Raphicercus campestris* and *Neotragus livingstonianus*. The penis of the example of *Nototragus melanotis* in which I found the preputial gland agrees with that of *Raphicercus campestris*.

XI.—On Four new Species of the Genus *Demodex*, Owen.
By STANLEY HIRST.

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Demodex soricinus, sp. n.

♀. A small species, the cephalothorax being fairly wide. Body a little more than three times the width of the cephalothorax. Abdomen pointed posteriorly and somewhat longer than cephalothorax + capitulum. Capitulum much wider than long. (The spines on the capitulum cannot be seen in the unique specimen, which lies ventral side uppermost.)

Total length 119 μ .

Host: *Sorex vulgaris*.

Demodex apodemi, sp. n.

♀. A very minute but fairly elongated species. Body about $4\frac{1}{2}$ times as long as the greatest width of the cephalothorax. Abdomen a little less than twice the combined length of cephalothorax and capitulum. Capitulum (at base) wider than the length. Spines on dorsal surface of capitulum well developed, being pointed at the end as in *D. musculi* etc.

Total length 139 μ .

♂. Body from a little more than 4 up to about 5 times as long as width of cephalothorax. Capitulum when fully extended about as long as wide.

Male sexual aperture situated above interval between second and third pairs of legs. Penis fairly long and slender.

Host: *Apodemus sylvaticus*.

Demodex longior, sp. n.

♀. An elongated species of comparatively large size, resembling *D. canis* in many respects. Body sometimes nearly nine times as long as the width of the cephalothorax. Abdomen about $2\frac{3}{4}$ times the combined length of cephalothorax and capitulum. Capitulum wider than long; the spines on its dorsal surface are short and somewhat curved.

Total length 280 μ .

♂. Abdomen about twice as long as the cephalothorax + capitulum. Body more than 6 times as long as the cephalo-

thoracic width. Male sexual orifice situated above the interval between the legs of the first and second pairs.

Note.—In one male specimen the tracheal tubes leading from the capitulum are quite distinct; each is at first double, but afterwards fuses to form a single wide lateral main trunk.

Host: *Apodemus sylvaticus*.

Demodex nanus, sp. n.

♀. A minute species very like that present in *Sorex vulgaris castaneus*. Length varying from less than 3 up to slightly more than 3½ times the width of the cephalothorax. Abdomen considerably shorter than combined length of cephalothorax and capitulum. Capitulum usually much wider than long; the spines on its surface apparently obsolete or absent.

Total length 87–102 μ .

Host: the black rat (*Rattus rattus*), a number of specimens collected by the author from a freshly killed rat.

Note.—Hahn has already described a species of *Demodex* (*D. rattus*) from a house-rat said to be *Mus rattus*. I have not been able to consult his original description, which is referred to by Gmeiner. The latter says the species is like that of the dog. From this one would infer that it was an elongated form of comparatively considerable size, similar to that found in *Rattus norvegicus*.

It is probable, indeed, that the rat from which Hahn's specimens were taken was really *Rattus norvegicus*, the brown or Norwegian rat (syn. *Mus decumanus*). It is, of course, possible that two species occur in *Rattus rattus*, as is certainly the case in *Apodemus sylvaticus*.

XII.—New Species of Gerbillus and Taterillus.

By OLDFIELD THOMAS.

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Gerbillus allenbyi, sp. n.

A small species, with short feet and tail; probably allied to *G. agag*.

General colour much more mouse-grey than the usual tone of gerbils, markedly greyer than *G. gerbillus*; head, shoulders, and most of the upper surface near "cinnamon-buff," but

the middle dorsal area greyer, though this difference may be less marked in older specimens. Under surface less absolutely pure white than usual, the hairs, especially in the inguinal region, with a slight tinge of buffy. Postorbital light patches present, but not very sharply defined; below them on each side, between eye and ear, there is a distinct patch of grey hairs. Ears with proectote buffy, the rest whitish; post-auricular white patch sharply defined. Hands and feet white, but a slight tendency to buffy appears on the wrists; soles all hairy except for a small round patch on the heel. Tail not proportionally long; dull buffy, little lighter below; its terminal dark crest inconspicuous.

Skull of the general build of that of *G. gerbillus*, but the bulla smaller. Supraorbital beads little developed.

Dimensions of the type (measured in flesh) :—

Head and body 70 mm.; tail 95; hind foot 24; ear 9.

Skull: greatest length 26·2; condylo-incisive length 23; zygomatic breadth 14·5; nasals 9·6; interorbital breadth 5·2; breadth of brain-case 13·3; zygomatic plate 3·9; palatal foramina, anterior 4·4, posterior 2·2; greatest horizontal diagonal diameter of bulla 9·2; breadth of bulla at right angles to last, exclusive of meatus, 5·7; upper molar series 4.

Hab. Coast region of Palestine. Type from Rehobot, near Jaffa.

Type. Young adult male. B.M. no. 14.5.29.5. Original number 8. Collected 3rd February, 1914, by T. Aharoni. Presented by the Hon. N. Charles Rothschild.

This is evidently the species which Nehring* assigned to *G. longicaudus*, Wagn. But Wagner's animal, which I have seen in Munich, was from Egypt, and was clearly referable to *G. gerbillus*, as has been shown by Anderson and de Winton.

The Palestine gerbil seems to be related to *G. apog.* Thos., but is readily distinguishable by its less bright colour, greyer back, and the greivish patches between eye and ear.

I have named it in honour of the general to whose forces the country where it occurs owes release from the barbarian domination under which it has suffered for so many centuries.

Gerbillus articola, sp. n.

Near *G. pygargus*, but the bulla larger.

Size and colour as in *G. pygargus*, of the same light desert-colour—quite unlike that of *G. dundi* of Central

Somaliland. Compared with a series from Shendy, the ground-colour is warmer, being near "warm buff" in *pygargus*, while it is "pinkish cinnamon" in *acticola*; but the variation in the colour of these desert-animals is so great that not much stress can be laid upon it. Sides lighter, line of demarcation high up. Postorbital and postauricular white patches well marked. Fore limbs wholly, hind limbs mostly white. Hind soles with a nearly naked stripe running along the inner side almost to the base of the hallux. Tail buffy above, white below; the terminal crest inconspicuous, brown.

Skull of the same stoutly built elongated form as in *pygargus*, the supraorbital bands similarly strongly developed. Bullae of similar shape, but decidedly larger than in any of the considerable series available of *pygargus* and *pyramidum*.

Dimensions of the type (measured in the flesh):—

Head and body 118 mm.; tail 144; hind foot 29; ear 15.

Skull: greatest median length 32.5; greatest diagonal length 32; condylo-incisive length 28.5; zygomatic breadth 17.4; nasals 12.7; interorbital breadth 6.6; breadth of brain-case 14.5; breadth between mental edges 16.3; zygomatic plate 4.7; palatal foramina, anterior 5.4, posterior 3; bullae, horizontal diagonal length 12; breadth at right angles to last, excluding meatus, 7; greatest diameter in any direction 12.7; upper molar series 4.1.

Hab. Coast region of N. Somali. Type from Berbera, other specimens from Bulhar.

Type. Adult female. B.M. no. 7. 11. 5. 4. Original number 32. Collected 30th July, 1905, and presented by Dr. R. E. Drake Brockman. Nine specimens.

This Somali representative of *G. pygargus*, distinguished by its larger bullae, is the species mentioned on p. 119 of Dr. Drake Brockman's 'Mammals of Somaliland' (1910) as the Coast Gerbil, a title I have Latinized as above.

Gerbillus collinus, sp. n.

A *Gerbillus* with an unusual amount of the soles naked and with very large bullae.

Size about as in *G. palta*. Fur long and loose. General colour strong sandy buffy, near "cinnamon-buff," not so inclined to russet as in *G. palta*. Line of demarcation on sides not very sharply defined. Lighter postorbital and postauricular markings scarcely perceptible. Ears short, their

proetote buffy like the general colour. Fore limbs wholly in the white area, without any darker colour on their front surface. Soles less haired than in other members of *Gerbillus*, the naked area extending from the heel along the middle of the sole to the level of the base of the hallux, but the region of the pads is closely and profusely hairy, as usual in the genus. Tail at base pale buffy above, whitish below—its terminal portion lost in the type.

Skull remarkable for the great size of the bullae, which tend to recall those of *Desmodillus* and far exceed those of any other member of this genus. The posterior breadth of the skull is therefore unusually great. Muzzle slender. Supra-orbital beads present. Zygomatic plate more projected forward than in most species of *Gerbillus*, and almost approaching the projection characteristic of *Taterillus*; the same is the case in *G. pscha*. Palatal foramina, both anterior and posterior, large and well open. Bullae greatly swollen, the anterior edge of the meatus also inflated; a well-marked vacancy just beneath the opening of the meatus.

Dimensions of the type (measured in the flesh):—

Head and body 92 mm.; tail (60+); hind foot 30; ear 15.

Skull: greatest median length 29; greatest diagonal length 30; cantho-incisive length 27; zygomatic breadth 16; nasals 11·2; interorbital breadth 6; breadth of braincase 14·3; breadth between outer edges of meatal inflations 16·8; zygomatic plate 4·8; palatal foramina, anterior 5·2, posterior 2·5; greatest horizontal diagonal diameter of bulla 10·7; greatest diameter in any direction 12·2; upper molar series 1·2.

Hab. Bushman-land. Type from Tuin, near Kenhart, Hartebeest River, near 29° S., 21° E.

Type. Adult male. B.M. no. 12. 1. 11. 2. Presented alive by Maj. H. A. P. Littledale to the Zoological Society, by whom it was transferred on death to the National Collection.

This well-marked species is readily distinguishable by its greatly enlarged bullae, which tend to approach in size those of *Desmodillus auricularis*, obtained in the same region by Major Littledale. The hind feet of this animal are also more naked than in other members of *Gerbillus*, but have, however, the characteristic distal cushion which distinguishes the genus from *Dipodillus*.

Taterillus gyas, sp. n.

A *Taterillus* with decidedly larger skull than any other.

Size rather, but not conspicuously, larger than in *T. emini*. General colour above strong and dark, near "cinnamon," or even approaching "tawny"; sides cinnamon-buff. Ears rather large. Hands and feet white; soles quite without any trace of the usual transverse band of fur. Tail long, its basal half brownish above, dull buffy below; terminal tuft well developed.

Skull conspicuously larger and more heavily built than in any known *Taterillus*. Interorbital region rather more parallel-sided than usual, the supraorbital ridges strongly developed. Posterior palatal foramina extending from the level of the front root of m^1 to the middle of m^2 . Bullae of average proportional size.

Dimensions of type (measured in flesh):—

Head and body 127 mm.; tail (damaged in type, 175 mm. in another specimen of about the same size); hind foot 34; ear 21.

Skull: greatest length 39; con-lylo-incisivo length 35; zygomatic breadth 19.5; nasals 15.6; interorbital breadth 7.3; breadth of brain-case 15.8; zygomatic plate 7.3; palatal foramina, anterior 7.2, posterior 4.6; horizontal diagonal diameter of bulla 10.2; upper molar series 5.5.

Hab. Kamisa, Dinder R., Sudan.

Type. Adult female. B.M. no. 14.3.8.24. Original number 55. Collected 26th December, 1913, by Willoughby P. Lowe, and presented by Abel Chapman. Two adult and six young specimens examined.

This *Taterillus* is remarkable for its large size and the complete absence of the hairy band across the soles. It thus considerably resembles the members of the genus *Tateromys*. But its elongate posterior palatine foramina show that its place really is in this genus, all the more that *T. gracilis* proves to be variable in the development of the same hairy band. In that species the band is commonly absent, faintly often slightly or partially developed, and occasionally fully developed, all extremes occurring in any one locality. This species ranges eastwards from the Gambia to Upper Nigeria, where it occurs side by side with *T. nigricus* on the Bauchi Plateau. The latter was first described from a single specimen, but about a score of gerbils have been more recently sent by Mr. Fox, and were all supposed to be of the same species as the first. I now find, however, that they

are mostly referable to *T. gracilis*, only four belonging to *T. nigeriæ*, which may be distinguished by its larger size, longer anterior palatine foramina, and uniformly longer feet, and these in all four examples have well-developed sole-bands.

XIII.—A new Duiker from Zanzibar.

By OLDFIELD THOMAS.

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THE British Museum has received from Dr. W. M. Aders, Government Biologist at Zanzibar, native skins of three local Ungulates, two antelopes and a *Potamochoerus*. One of the former is that of a *Nesotragus moschatus*, but the other represents a duiker quite distinct from any species hitherto described.

In honour of its donor, to whom the Museum is indebted for many Zanzibar mammals, it may be called

Cephalophus adersi, sp. n.

Allied to *C. weynsi**, but with whitish bands across thighs and a white tufted tail.

Size and general characters about as in *C. weynsi* of the Congo. Line along nape with reversed fur, as in that species. General colour of withers and nape dark brown (near mummy-brown), which gradually becomes more rufous (darker than "avellaneous") on the shoulders and flanks, and posteriorly on the rump passes into deep rich chestnut-rufous ("mahogany-red" where richest). Under surface whitish, not sharply defined laterally, the hairs pale drabby at base, whiter terminally; a mesial rufous patch on the chest. Fore limbs with the avellaneous rufous of the shoulders passing down without interruption, but on the hind-quarters there is a broad whitish band running across the outer side of the hips and separating the chestnut-red of the rump from the rather paler red of the legs; this band is more or less rufous white where it commences on the sides above the inguinal glands, but becomes nearly pure white posteriorly, where it

* Figured and described, Ann. Mus. Congo, ii. p. 15, pl. vi. (1901).

contrasts prominently with the mahogany-red rump. Fore and hind feet deep rufous speckled with white, but how far these white specklings may be an individual abnormality I have no means of judging. Tail, without tuft, about 2 inches in length, the tuft well marked, its hairs rather more than an inch long, wholly white, though there is a narrow rufous line running along the top of the tail basally.

Middle of neck to rump about 24 inches.

Hab. Zanzibar.

Type. Native skin. B.M. no. 18. 5. 25. 1. Presented and collected by Dr. W. M. Aders.

By its reversed nape-hairs and general type of coloration, with brown fore back and rufous rump, this striking duiker shows relationship to *C. weynsi*, but it is at once distinguished by the whitish bands which run across the thighs and show up the brilliant rufous of the rump, and by the wholly white tail-tuft, that of *C. weynsi* being prominently blackish above.

These characters are so marked that, although the specimen is a native skin, without head or hoofs, I feel justified in describing it, but hope Dr. Aders may soon be able to obtain a complete example of so striking an animal, on whose discovery he is to be congratulated.

XIV.—Notes on *Alcides*, Schönh. (*Curculionidæ*, *Coleoptera*).

By GUY A. K. MARSHALL, D.Sc.

CONSIDERABLE confusion exists in collections with reference to the strikingly marked species of *Alcides* related to *A. delta*, Pasc. Pascoc's original description (Journ. Linn. Soc. Lond., Zool. x. 1870, p. 160) was based on three specimens, from Ceylon, Ceram, and Amboyna respectively; of these he selected the Ceylon specimen as his type, and the other two examples now prove to belong to a quite distinct species. Subsequently he gave a figure of *A. delta* (*ibid.* xi. 1871, pl. ix. fig. 10), but instead of illustrating his type he unfortunately selected a so-called "variety," which turns out to be yet a third species, and was later described by Kirsch under the name of *triangulifer* (Mitt. Mus. Dresd. i. 1875, p. 40). Probably misled by Pascoc's figure, Aurivillius in 1891 (Nouv. Arch. Mus. Paris, (3) iii. p. 218) sunk *triangulifer* as a synonym of *delta*, and thus it stands in Bovie's 'Catalogue of Alcidiine' (Wytman, fasc. 71).

the species except *G. sammeringii*, for which I was dependent upon a dried skin. Since that date I have been able to confirm my observations upon additional and fresh material of *G. bennetti*, *subgutturosa*, *ruffrona*, *dorcas*, *pelzelni*, and *sammeringii*, and can now add to the list one previously unexamined species—namely, *G. dama*.

Some notes upon the examples of *G. sammeringii* and *G. dama* may be of interest.

Gazella sammeringii berberana.—Specimens from Somaliland (R. E. Drake Brockman). The preorbital gland is of moderate size or small. The pedal glands are quite normal. The inguinal glands are shallow wide-mouthed pouches external to the mammae. The carpal glands are thick pads of skin, covered with a mat of convergent hairs.

In a male example the secretion from the inguinal glands smelt like sour milk. In a female the secretion from the same glands, like that from the knees, had a strong ovine scent, like that of a pen of domestic sheep, whereas the waxy secretion from the pedal glands resembled dogs' dung in odour.

The rhinarium (fig. 1, I) is a little less reduced than in typical gazelles, in which it consists of hardly more than a small irregularly pentagonal area of naked skin restricted to the septum between the nostrils (fig. 1, G, H). But in *G. sammeringii* its upper edge is slightly expanded and spreads a little to the right and left, partly hanging over the nostrils above.

In the penis (fig. 1, B) the tubular prolongation of the urethra is short, barely projecting beyond the tip of the slightly swollen termination of the glans. It is shorter than in ordinary gazelles—e. g., *G. bennettii* (fig. 1, D) and *G. rufina*, figured by Lönnberg in 1904.

Gazella dama ruficollis.—Examples (♂ ♀) from the Soudan (G. Blaine). The preorbital gland is a shallow pit, quite small as compared with that of the typical gazelles. The pedal glands are quite normal. The inguinal glands consist of a pair of very shallow wide-mouthed pouches, one on each side just external to the corresponding mamma. The carpal or knee-glands, on the contrary, are rather exceptionally well developed, consisting of a pad of thick skin, overgrown with a mat of mesially convergent hairs covered with scurfy secretion.

The end of the penis in this species is slightly enlarged and the urethra is prolonged as a thin tube a little beyond the tip of the glans (fig. 1, C).

It has been suggested that the three large white-rumped

As a matter of fact, *A. delta* differs from both the other forms mentioned above in a very striking character; normally in *Alcides* each tarsal claw is deeply cleft, but in *A. delta* the claws are simple and soldered together at the base. This character is also found in yet another new and allied species, likewise from Ceylon. I have not so far observed it elsewhere in the genus, though Lacordaire mentions its occurrence without citing any species. *A. triangularis* presents a somewhat intermediate condition, the inner division of the claw being very much reduced.

The following table will serve to discriminate the members of this group, all of which possess a similarly-shaped large patch of silvery-white scales on the side of the meso- and metasternum, and this also occurs in the very differently marked *A. kirschi*, Pasc., from Labuan:—

- | | |
|--|-----------------------------|
| 1 (4). Tarsal claws simple, connate at the base; sides of prothorax not constricted in front; gense of ♂ not produced downwards at the apex. | |
| 2 (3). Transverse impression at base of elytra shallow, base of prothorax not lower than the apex; apical edge of rostrum produced into a short point in the middle | <i>delta</i> , Pasc. |
| 3 (2). Transverse impression on elytra very deep, base of prothorax distinctly lower than the apex; apical edge of rostrum shallowly emarginate in the middle.. | <i>ephippiatus</i> , sp. n. |
| 4 (1). Tarsal claws cleft; sides of prothorax markedly constricted in front; gense of ♂ with a tusk-like downward process at the apex. | |
| 5 (14). Elytra with a large common triangle formed of broad pale stripes enclosing a black triangle; front tibia with an internal tooth placed nearly in the middle. | |
| 6 (9). Peduncle of submentum narrowly oblong (2×1) and shallowly constricted at the extreme base only; anterior pale stripe on prothorax running transversely upwards along the edge of the granulate area, not covering the post-ocular lobe. | |
| 7 (8). Apical margin of rostrum rounded; scutellum pointed at apex; post-humeral stripe on elytra not uniting behind with posterior angle of the pale triangle | <i>ceramodella</i> , sp. n. |
| 8 (7). Apical margin of rostrum with a short sharp point in the middle; scutellum | |

- rounded at apex; post-humeral stripe on elytra uniting broadly with the posterior angle of the triangle *muiri*, sp. n.
- 9 (6). Peduncle of submentum subtriangular, broad at apex and very strongly narrowed behind; prothorax with an ill-defined pale stripe covering the whole postocular lobe and running obliquely backwards on to the disk.
- 10 (11). Shoulders of elytra produced outwardly into a sharp angle; setæ at apex of tibiae blackish *siamodelta*, sp. n.
- 11 (10). Shoulders of elytra obtuse; setæ at apex of tibiae reddish.
- 12 (13). Elytra broader, broadest at the shoulders and narrowing gradually behind; aedeagus of ♂ with the median lobe narrowed to a point at the apex; prothorax with an oblique blackish stripe running from the eye almost to the base *triangulifer*, Kirsch.
- 13 (12). Elytra narrower, almost parallel-sided from the shoulders to beyond the middle; aedeagus of ♂ with the median lobe dilated at the apex, its apical margin very broad and sinuate; prothorax with the black mark behind the eye confined to the non-granulate apical area *javanodelta*, sp. n.
- 14 (5). Elytra without any distinct triangular markings, the oblique discal pale stripes diverging from the middle to the shoulders instead of converging towards the scutellum; the internal tooth on the front tibiae much nearer to the base than to the apex *magicus*, Pasc.

Alcides delta, Pasc.

So far as is known at present the true *A. delta* is confined to the lowlands of Ceylon.

Alcides ephippiatus, sp. n.

♂ ? . This species has the same general facies and pattern as *A. delta*, as well as the simple and connate claws, but differs as follows:—The pale markings are usually covered with a dark pink or pinkish-brown powdering, and the stripes on the elytra are generally narrower, so that the enclosed black triangle is larger; the infra-humeral stripe is reduced to one-half the length or less; in the V-shaped apical patch the outer arm (on interval 7) is only half as long as the

inner (on interval 3), whereas in *delta* they are equal or nearly so. The rostrum is proportionately much shorter, and the apical edge is shallowly emarginate in the middle. The dorsal outline of the prothorax is much more convex, so that the basal margin is well below the plane of the apical. The elytra are proportionately shorter, the basal transverse impression being much deeper, so that the dorsal outline is strongly convex; intervals 3 and 4 are not so markedly costate at the base, and the scales that form the pale markings are much smaller, most of them being very deeply fringed at the apex.

Length 10–13½ mm., breadth 4½–5½ mm.

CEYLON: Dikoya, 4000 ft. (type), and Bogawantalawa, 5000 ft. (G. Lewis); Kandy (E. E. Green).

The deeply sinuous dorsal outline of this species renders it easily recognizable. It appears to be the mountain representative of *A. delta* in Ceylon.

Alcides siamodelta, sp. n.

♀. Closely resembling Pascoe's figure of *A. triangulifer* (l.c.), except that the shoulders of the elytra are produced outwardly into a sharp angle. Other distinctions are:—In *triangulifer* the 7th joint of the funicle is elongate and equal to or longer than the club (4:3–4), in the transverse pale band forming the base of the triangle on the elytra the intervals are distinctly granulate, the apical setae on the tibiae are reddish, and the tarsal claws have the inner division unusually short and slender; in *siamodelta* the 7th joint of the funicle is transverse and distinctly shorter than the club (2½:4), the intervals are not granulate in the transverse band of the elytra, the apical setae on the tibiae are blackish, and the tarsal claws are normal, the inner division being about three-fourths the length of the outer.

Length 9½–10½, breadth (at shoulders) 5¼–6 mm.

FRENCH INDO-CHINA: LAOS (type): SIAM.

Alcides triangulifer, Kirsch.

So far as I know at present this insect is confined to the Malay Peninsula, Burma, and the Nicobars. Insects recorded from Borneo under the name of *A. delta* will probably be found to belong to a distinct species.

Alcides javanodelta, sp. n.

♂ ♀. Apart from its narrower form and shorter rostrum.

extremely similar to *A. triangulifer*. In addition to the characters given in the key, the following distinctions have been noted:—The mentum is quite flat (in *triangulifer* it bears a shallow longitudinal impression); the proportions of the 7th funicular joint to the club are $2\frac{2}{3}:3\frac{1}{2}-4$ (in *triangulifer* 4:3-4), and the intermediate tibiae are simply angulate in the middle internally (in *triangulifer* there is a sharp tooth). But its most striking character is the broad dilatation at the apex of the median lobe of the ædægus, for in all other species of the group this organ is pointed at its tip, as is usual in the genus.

Length $8\frac{1}{2}$ – $12\frac{1}{2}$ mm., breadth $3\frac{1}{2}$ – $5\frac{1}{2}$ mm.

JAVA.

All the specimens of this group that I have seen from Java belong to this species. There is in the British Museum a single specimen labelled Singapore (*Coll. Atkinson*), but it seems possible that the locality may be erroneous.

Alcides ceramodonta, sp. n.

♂ ♀. While this species agrees with *triangulifer*, as compared with *della*, in the structural characters mentioned in the key, it differs from it in the pattern of the prothorax, which quite resembles that of *della* and *ephippiatus*, the general colour being blackish brown, with the usual oblique lateral pale stripe above the coxæ, a transverse subapical pale band running along the anterior edge of the granulate area, and a pale central stripe.

The general form is broader in proportion to its length than in any of the other species. The rostrum is proportionately short and stout, and its apical margin is rounded, with traces of very feeble undulations; the peduncle of the submentum differs from that of all other members of the group (except *A. muiri*) in its more narrowly oblong form. In the antennæ the 7th joint of the funicle is shorter than the club (3:4)*. The prothorax is very similar in shape to that of *triangulifer*, but the granules are slightly smaller and there is no trace of the shallow median stria. The scutellum is bluntly pointed at its apex, whereas in all the other species it is broadly rounded. The intervals on the elytra are more distinctly granulate than in *della* and rather less carinate than in *triangulifer*, thus giving the

* By actual measurement; owing to the club being pointed, it appears relatively shorter than it really is.

elytra a somewhat smoother appearance. The legs are markedly shorter than in *triangulifer*, but the tarsal claws are similar, the inner division being much reduced; the median tooth on the middle tibiae is almost as long as that on the front pair.

Length 12½–13, breadth 6½–6¾ mm.

CERAM (type); AMBOINA (A. R. Wallace).

Alcides muiri, sp. n.

♂. Pattern similar to that of *A. delta* and *A. ceramodella*, except that the post-humeral stripe on the elytra unites broadly with the posterior angle of the pale triangle on each side; the edges of the pale markings rather ill-defined.

Very similar in structure to *A. ceramodella*, but the elytra distinctly narrower. The rostrum proportionately longer and its dorsal outline less convex than in that species, the length equal to that of the middle dorsal line of the prothorax (4 mm.), whereas in the latter the rostrum is 4 mm. and the prothorax 5 mm.; the apical margin of the rostrum with a short sharp central projection, and the genæ produced downwards. The prothorax with comparatively fine and close granulation, its dorsal front margin rather strongly rounded. Scutellum broadly rounded at the apex. The intervals of the elytra with low granules throughout. The tooth on the middle tibiae only slightly smaller than that on the front pair, the hind pair distinctly angulate internally, the apical fringe of a chestnut colour; tarsal claws cleft, the inner division very small.

Aleagus about half the width of that of *A. ceramodella*; the spiculum fine and hair-like, more slender than in any of the other species, its median width one-third of that of *A. ceramodella*.

Length 13, breadth 6 mm.

TIMOR-LAUT Is.: Larat (F. Muir).

The following corrections must be made in Bovic's 'Catalogue of the Alcidinae' (Wytman, fasc. 71):—

(*A. wahlbergi*, Chev. 1881 = *humerosus*, Ancey, 1881, nec Har. 1880 = *anceyi*, Bovic, 1908) = *A. olivaceus*, Gerst. 1862.

(*A. curialis*, Pasc. 1883) = *A. transversus*, Walk. 1859.
Ann. & Mag. N. Hist. Ser. 9. Vol. ii. 12

(*A. parilis*, Pasc. 1882) is the ♂ of *A. indigaceus*, Pasc. 1882.

(*A. rubrirostris*, Pape, 1907) = *A. lameerei*, Faust, 1899.

(*A. trilineatus*, Faust, 1891) = *A. signatus*, Boh. 1836.

* *A. signatus*, Boh., is cited by Bovie (on the authority of Faust) as an African species, but in reality it is Indian; and all the specimens identified by Faust under this name (cf. Ann. Soc. Ent. Belg. 1899, p. 415) will almost certainly prove to be *A. arcuatus*, Boh.

A. roelofsi, Lewis, is omitted from Bovie's Catalogue; it was proposed (Ann. & Mag. Nat. Hist. 1879, p. 465) as a new name for *A. albolineatus*, Roel. 1875 (see Boh. 1836), and *A. sexvittatus*, Faust, 1894, falls as a synonym of it.

The genus *Acerus*, Pasc., should not be included in the Alcidiinae; it belongs to the Hylobiinae, being nearly related to *Paipalesomus*, Schl.

XV.—On the Varieties of the Lizard *Ophiops elegans*, Mén.
By G. A. BOULENGER, F.R.S.

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THIS lizard, the type of the remarkable genus *Ophiops* established by Ménétriés in 1832, the distinguishing feature of which resides in the apparent absence of eyelids*, varies

* "Palpebra inferior nulla, superior tantummodo rudimenta." Ménétriés.—"Oculi palpebris destituti, capsula oculari instructi." Wiegmann.—"Pas de paupières," Duméril & Bibron.—"Eyelids none," Günther. I have long ago set right this misconception. The only character distinguishing this genus from *Cabrita*, Gray, is the fusion of the lower eyelid with the upper, a state of things conveying the appearance of an absence of the eyelids. What was supposed to be the corner of the eye in *Ophiops* is the transparent disc of the lower lid, neither more nor less developed than in *Cabrita*. Although united with the upper, the lower eyelid is, however, not absolutely immovable. On touching the transparent disc in an *Ophiops occidentalis* which I had alive, I observed this to be at once lowered, the upper half of the eye being then covered by the granular portion of the lid.

considerably in the lepidosis, more or less according to the districts it inhabits, and has, in consequence, given rise to the establishment of a certain number of species, untenable as such. However, with a large material (I have carefully examined about 350 specimens) it is just possible to draw up definitions justifying the retention of some of these forms, whilst degrading them to a subordinate rank.

The typical *Ophiops elegans* was founded on specimens from Transcaucasia, in which, according to Boettger, the number of scales and plates round the body varies between 34 and 40*. Those examined by me are from Asia Minor (Angora, Kaisariéh, Albistan, Giaour Dagh).

The varieties which I recognize are four in number. Their characters are contrasted with those of the typical form in the following synopsis, intended to apply to series of specimens:—

32 to 41 (usually 34 to 40) scales and plates round middle of body; 7 to 13 (usually 9 to 12) femoral pores on each side; collar distinct only on the sides; occipital small or very small	Forma typica.
23 to 34 scales and plates round middle of body; 8 to 12 (usually 9 to 11) femoral pores on each side; collar distinct only on the sides; occipital small or very small	Var. <i>ehrenbergii</i> .
30 to 37 (usually 31 to 30) scales and plates round middle of body; 8 to 11 (rarely 12) femoral pores on each side; collar often distinct, sometimes five across the throat; occipital rather large, sometimes 2 to 2½ times the width of the interparietal	Var. <i>persicus</i> .
30 to 34 scales and plates round middle of body; 11 or 12 femoral pores on each side; nostril between 3 shields, a single postnasal being present.	Var. <i>mizolepis</i> .
38 to 40 (usually 40 to 40) scales and plates round middle of body; 10 to 16 (usually 11 to 15) femoral pores on each side; collar and gular fold often distinct; occipital small or very small.	Var. <i>schluteri</i> .

Var. *ehrenbergii*.

Anystes ehrenbergii, Wieg. Arch. f. Naturg. 1835, ii. p. 1.

As has been pointed out by Boettger, the specimens from Western Asia Minor and the Southern Sporades differ from

* Having counted them in 70 specimens from Angora, I find 16 specimens with 30 scales and plates, 12 with 37, 11 with 38, 8 with 40, 7 with 39, 6 with 35, 6 with 34, 2 with 33, 1 with 32, 1 with 41. 10 femoral pores in 68, 11 in 46, 9 in 22, 12 in 9, 13 in 4, 8 in 1.

the typical form in having larger scales on an average. The same form occurs also in Syria (*Amyxites ehrenbergii*, Wiegman.), together with the small-scaled *O. schlueteri*, Boettg.

I count 28 to 34 scales and plates round the middle of the body; the posterior dorsals are sometimes nearly as large as the upper caudals, forming 7 to 10 longitudinal series between the hind limbs. The lower border of the subocular is usually longer than in the typical form, $\frac{1}{3}$ to $\frac{1}{2}$ the length of the upper border, rarely $\frac{1}{4}$.

The specimens examined by me are from Constantinople, Smyrna, Xanthus, Meander Valley, Zebil Bulgar Dag (Cilician Taurus), Lebanon, Mt. Hermon, Mt. Tabor, Samaria, Galilee, Jerusalem.

Var. *persicus*, nov.

The specimens from Persia (Supergha, L. Urmi, Isfahan, Shiraz, Karman) are distinguished by the larger occipital, which may be twice or twice and a half the width of the interparietal, and the more extensive share taken by the subocular in the border of the mouth, agreeing with the var. *ehrenbergii* in the latter respect. The collar is often more distinct, sometimes free across the throat. 30 to 37 scales round the middle of the body, usually 31 to 36. 8 to 11, rarely 12, femoral pores on each side.

Var. *mizolepis*.

Gymnops mizolepis, Stoliczka, Proc. As. Soc. Beng. 1872, p. 124.

Ophiops mizolepis, Blanf. E. Persia, p. 309, pl. xxv. fig. 2.

A single specimen from the low country S.W. of Kalabagh, on the Indus, has been made the type of a distinct species, and even referred to a distinct genus, on account of the presence of a single postnasal instead of two. I have not seen the specimen, stated to have 34 scales and plates round the body and 12 femoral pores on each side, but there is nothing in the description to warrant a separation from *O. elegans*, and I should have felt inclined to regard the presence of one postnasal instead of two as an individual peculiarity, such as I have noticed in the var. *schlueteri* and in *O. occidentalis*, were it not that Blanford has rediscovered the same form at Basra, Mesopotamia, where it is said to occur in abundance, and where the character appears to be fixed*. It is also noteworthy that the only two specimens

* According to Blanford, it occurs as a rare exception in S. Persia:

from Haifa in Palestine examined by Boettger are distinguished from all other Syrian individuals by the same character. In view of the constancy of the single postnasal in individuals from certain localities, I retain *O. mizolepis* under a varietal name, but provisionally only and with some doubts as to its validity.

I have examined two of Blanford's Basra specimens, as well as two recently obtained at the same place by Col. Wall * and one from Amara, Mesopotamia, received from Capt. P. A. Buxton.

Var. *schlueteri*.

Ophiops schlueteri, Boettg. Ber. Senck. Ges. 1879-80, p. 176, pl. iii. fig. 3.

This is the most distinct of the various forms grouped under *O. elegans*, and one might feel inclined to regard it as a valid species. There is, however, an overlap in the numerical character of the scales as compared with the typical form, and no constancy in the other characters pointed out in the original description; so that it is better to treat *O. schlueteri* as a variety, completely connected with the typical form and the var. *ehrenbergii*.

The dorsal scales are small, the posterior always much smaller than the basal caudals; they form 10 to 14 longitudinal series between the hind limbs; 38 to 49 scales and plates round the middle of the body, usually 40 to 46. The femoral pores number 10 to 16 on each side, usually 11 to 15. The temporal scales are usually smaller than in the typical form (50 to 90 instead of 34 to 63, 27 to 50 in the var. *ehrenbergii*). A more or less distinct gular fold; collar usually distinct, but very rarely quite free. The subocular borders the mouth very narrowly, its lower border is rarely more than one-fourth the length of the upper. One specimen has a single postnasal instead of two.

This variety is confined to Palestine (I have examined specimens from Mt. Hermon and Baalbeck) and Cyprus. It should be regarded as, on the whole, the most primitive of the forms included under *O. elegans*.

"In two specimens . . . the lower nasal is joined to the lower postnasal, so that the nasal shields resemble those in *Chondrophis* [= *Gymnops*] or *Eremias*."

* Preserved in the collection of the Bombay Natural History Society.

XVI.—Description of a new Lizard of the Genus *Acanthosaura* from Yunnan. By G. A. BOULENGER, F.R.S.

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Acanthosaura varcoeae.

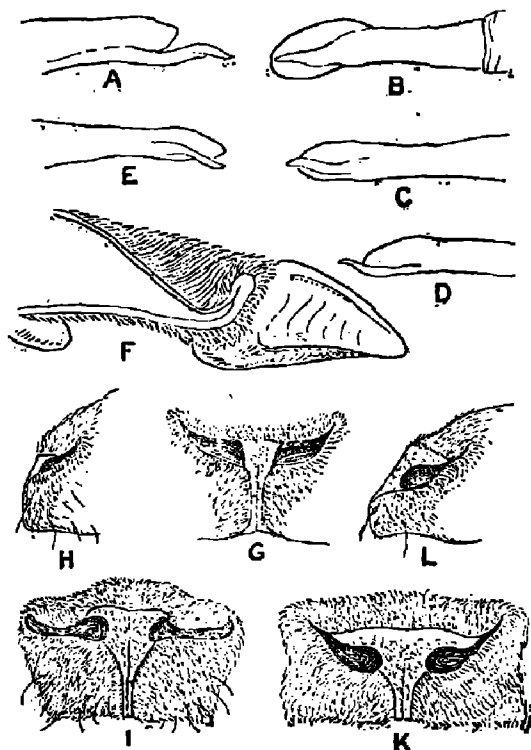
Head once and one-third as long as broad; snout a little longer than the diameter of the orbit; canthus rostralis and superciliary edge sharp; tympanum nearly as large as the eye-opening; upper head-scales unequal, granulate and keeled, a few, near the ear, raised and spine-like; 14 or 15 scales in a transverse series between the superciliary edges; 8 upper and as many lower labials; gular scales smaller than largest ventrals. A strong oblique fold in front of the shoulder. Body neither compressed nor depressed; dorsal scales very unequal in size, imbricate, strongly keeled; nuchal crest very low, continued on the body as a series of enlarged, strongly keeled scales; two interrupted series of strongly enlarged, strongly keeled scales along each side of the back; ventral scales strongly keeled and mucronate, the median smaller than the laterals. Fourth finger a little longer than third. Hind limb reaching the ear in the male, the shoulder in the female. Tail cylindrical, not crested. Yellowish or reddish brown above, male with a cream-coloured dorso-lateral band; 5 chevron-shaped blackish bars across the back; sides with a wide-meshed black network; an oblique black streak from the lower eyelid to the commissure of the jaws; upper lip cream-colour; limbs with black cross-bars; lower parts white.

	♂. mm.	♀. mm.
Total length	168	187
Head	19	19
Width of head	14	14
Body	44	53
Fore limb	31	31
Hind limb	43	43
Tail	105	115

Two specimens, preserved in the British Museum—a male from Yunnan Fou and a female from Wuting Chu,—received from Mr. J. Graham in 1914.

The species is named after Mrs. Graham (maiden name, Varcoe).

Fig. 1.



- A. Extremity of penis of *Antilope cervicapra*.
 B. The same of *Gazella sammerringii*.
 C. The same of *G. dama*.
 D. The same of *G. bennettii*.
 E. The same of *Antidorcas marsupialis*.
 F. Section of the fore foot of *Lithocranius scelleri*.
 G. Rhinarium of *Gazella rufifrons* from the front, $\times \frac{1}{2}$.
 H. The same from the side.
 I. The same of *Gazella sammerringii* from the front, $\times \frac{1}{2}$.
 K. The same of *Antilope cervicapra* from the front, $\times \frac{1}{2}$.
 L. The same from the side.

XVII.—Notes on the Braconidæ in the British Museum.—

IV. On new Helconinæ, mostly Australian. By ROWLAND E. TURNER, F.Z.S., F.E.S.

Key to the Australian Genera of Helconinæ.

- | | |
|---|-------------------------------|
| 1. Recurrent nervure received by second cubital cell | <i>Megalohelcon</i> , gen. n. |
| Recurrent nervure received by first cubital cell | 2. |
| 2. Median lobe of mesonotum depressed below the lateral lobes | <i>Parahelcon</i> , Kokuj. |
| Median lobe of mesonotum not depressed .. | 3. |
| 3. Anal cell of fore wing with two fully developed transverse nervures; first tergite large, constricted at one-third from the base, the basal portion bilobed and massively subtuberculate on each side of the anterior margin | <i>Calohelcon</i> , gen. n. |
| Anal cell of fore wing with one transverse nervure, rarely with indications of the second; first tergite not abnormal | 4. |
| 4. Frontal excavation present | 5. |
| Frontal excavation absent | <i>Aspidocolpus</i> , Wesm. |
| 5. Anal cell of fore wing with indications of a second transverse nervure | <i>Gymnoscelus</i> , Först. |
| Anal cell of fore wing without any indication of a second transverse nervure | 6. |
| 6. Median segment and two basal tergites clothed with dense grey pubescence; second tergite with a median longitudinal carina .. | <i>Trichohelcon</i> , gen. n. |
| Median segment and abdomen without dense pubescence; second tergite without a carina | <i>Austrohelcon</i> , gen. n. |

Typical *Gymnoscelus* has the second transverse vein of the anal cell fully developed.

MEGALOHELCON, gen. nov.

Mandibles bidentate at the apex, the inner tooth much longer than the outer; anterior margin of the clypeus straight. Face produced into a spine above the base of the clypeus, with a curved carina on each side near the inner margin of the eyes; cheeks as long as the third joint of the flagellum. Head large, transverse, as broad as the thorax; eyes broadly oval, ocelli very large; frontal depression not well defined. Antennæ about 77-jointed. Median lobe of the mesonotum

broad, slightly depressed in the middle, the parapsidal furrows very broad and deep. Median segment areolated. Abdomen elongate-fusiform, slender at the base; the apical dorsal segment narrow, with short cerci, terebra very short. Radial cell not quite extending to the apex of the fore wing; first cubital cell only divided from the discoidal on the apical half, the cubital nervure obsolete on the basal half of the cell; second cubital cell long and narrow, about half as long again on the cubitus as on the radius; second transverse cubital nervure oblique, sloping outwards from the cubitus to the radius, less than half as long as the second abscissa of the radius; recurrent nervure received near the base of the second cubital cell; anal cell with only one transverse nervure, nervulus slightly postfurcal.

Megalohelcon torresensis, sp. n.

♀. Testacea; mandibulis apice nigris; alis hyalinis, venis fuscis; cellula radiali margine costali anguste infuscata. Long. 22 mm.

♀. Antennæ as long as the thorax and abdomen combined, second joint of the flagellum a little longer than the third, twice as long as the first. Face rugulose, mesonotum finely and closely punctured; pleuræ almost smooth, the grooves very coarsely crenulated. Dorsal surface of the median segment about equal to the scutellum in length; with a median carina and a slightly oblique lateral carina on each side, all meeting the strong apical transverse carina; on each side of the segment is a strong carina reaching from the base to the very large elongate spiracle; the apical slope of the segment has a small oval area at the base, with a median longitudinal carina beyond it; near the lateral margins are two longitudinal carinæ on each side. First tergite more than three times as long as its apical breadth, the spiracles just beyond one-third from the base, subtuberculate. Apical ventral segment strongly compressed laterally, the terebra very short, only slightly exerted, probably usually withdrawn.

Hab. Islands in Torres Straits.

In the position of the recurrent nervure this resembles the genus *Brulleia*, Szépl., but is very distinct otherwise. Doubtless the large ocelli, the long antennæ, and the pale colouring indicate nocturnal habits. All other *Helconinæ* recorded from Australia are from S.E. Australia and Tasmania, and I never saw any species of the group during my long residence in North Queensland.

Genus *PARAHELCON*, Kokuj.*Parahelcon*, Kokuj. *Revue Russe Ent.* i. p. 14 (1901).*Parahelcon konowi*, Kokuj.*Parahelcon konowi*, Kokuj. *Revue Russe Ent.* i. p. 15 (1901). ♀.
(Opus euthyrrhini, *Cam. Proc. Linn. Soc. N.S.W.* xxxvii. p. 19 (1912). ♀.*Hab.* Gosford, N.S.W.

This genus is easily distinguished by the strongly depressed median lobe of the mesonotum. The neuration is as in *Gymnoscelus*; the anal cell has two cross-nervures, but the second is incomplete. The second transverse cubital nervure meets the cubitus at right angles, not oblique as in typical *Gymnoscelus*.

CALOHELCON, gen. nov.

Anal cell of fore wing with two transverse nervures; nervulus interstitial or very slightly postfurcal; second transverse cubital nervure slightly oblique, not quite at right angles to the cubitus; first discoidal cell with a very short petiole, almost sessile. Frontal excavation fairly deep; median lobe of the mesonotum normal; parapsidal furrows not very deep, not crenulated. Median segment smooth, not areolated. First tergite as broad at the apex as the second, narrowed at about one-third from the base, the basal portion bilobed on the anterior margin and swollen on each side, at least as long as the apical breadth, twice as broad at the apex as at the base. Terebra at least as long as the whole insect.

Type of the genus, *C. obscuripennis*, Turn.

Calohelcon obscuripennis, sp. n.

♀. Nigra; capite rufo, antennis nigris; segmento mediano dimidio apicali, segmento abdominali primo, macula mediana dorsali subapicali nigra, albidulis; alis fusco-hyalinis.

♂. Femine similis.

Long., ♀, 15 mm., terebræ long. 17 mm.; ♂, 14 mm.

♀. Clypeus narrowly depressed at the apex, the apical margin straight, not reaching the mandibles in the middle. Head massive, broader than the thorax, vertex and front smooth and shining, a short longitudinal carina between the antennæ; face finely punctured, with an impressed longitudinal line on each side from the base of the antennæ to the

clypeus; posterior ocelli twice as far from the eyes as from each other. Antennæ about 50-jointed, second joint of the flagellum fully three times as long as the first. A large curved depression, longitudinally striated, at the base of the scutellum. Thorax and median segment smooth and shining. Abdomen smooth and shining, the valvulæ clothed with short hairs. Spiracle of the median segment small and round.

Hab. Victoria (*French*), ex coll. Turner.

A variety in the British Museum collection without data has the prothorax and mesonotum red and measures 18 mm. in length. This may prove to be distinct or a local race. The length of the second abscissa of the radius seems to be variable in this species.

AUSTROHELCON, gen. nov.

Very near the genus *Gymnoscelus*, Först., differing in having only one transverse nervure in the anal cell of the fore wing instead of two, and the second transverse cubital nervure straight, forming a right angle with the cubitus, not oblique. The genus *Eulyia*, Cam., from Borneo, is somewhat intermediate between the two genera, having the second cubital cell as in *Gymnoscelus*, but the second transverse vein of the anal cell almost obsolete. The frontal excavation is shallower and less sharply defined than in *Gymnoscelus* and *Eulyia*. The nervulus in *Eulyia* and *Austrohelcon* is distinctly postfurcal, not interstitial as in *Gymnoscelus*.

Type of genus, *A. meridionalis*, Turn.

Key to the Species of *Austrohelcon*.

- | | |
|---|-----------------------------------|
| 1. Head black; thorax almost entirely rufotestaceous..... | 2. |
| Thorax almost entirely black..... | 4. |
| 2. Joints 2-4 of the hind tarsi yellowish white..... | 3. |
| Third and fourth joints of the hind tarsi only whitish..... | <i>A. australianus</i> , Kokuj. |
| 3. Pronotum, base of scutellum, and the middle of the mesosternum black.... | <i>A. indultor</i> , Erichs. |
| Thorax entirely rufotestaceous..... | <i>A. inornatus</i> , Kokuj. |
| 4. Head, except the ocular region, red.... | <i>A. erythrocephalus</i> , Turn. |
| Head black..... | <i>A. meridionalis</i> , Turn. |

Austrohelcon meridionalis, sp. n.

♂. Nigra; olypeo apice mandibulisque basi fusco-ferrugineis; abdomine rufo-ferrugineo, valvulis terebræ nigris; antennis 43-articulatis, articulis 14-22 albido-flavis; pedibus rufo-testaceis, tibiis posticis tertio apicali, tarsis posticis articulo apicali, unguiculisque nigris; alis hyalinis, venis fuscis; tegulis testaceis. Long. 9-11 mm.; terebræ long. 13-14 mm.

♀. Clypeus short, the apical margin deflexed and straight, not reaching to the mandibles, leaving a space in which the ciliated labrum is exposed. Face closely punctured, with more or less developed striæ, and a low but distinct longitudinal carina. Front and vertex smooth and shining, the frontal depression large but not very deep, the lower portion distinctly margined laterally. Pronotum rugose; the median lobe of the mesonotum rather prominent, shining in front, coarsely and irregularly reticulate posteriorly, the parapsidal furrows very coarsely crenulated; lateral lobes of the mesonotum smooth and shining; pleuræ rugulose, the mesopleuræ smooth and shining in the middle; scutellum finely punctured, with a longitudinally striated depression at the base. Median segment coarsely and irregularly rugose reticulate. Abdomen smooth and shining; the first tergite with two longitudinal carinae from the base to beyond the middle, the basal half finely punctured, about three times as long as its apical breadth. Hind metatarsus not quite as long as the three following joints combined. Radius not quite reaching the apex of the fore wing; second abscissa of the radius distinctly longer than the first, about equal to the second transverse cubital nervure; first discoidal cell distinctly petiolate.

Hab. Victoria (*French*).

The colour varies considerably, some specimens having the hind tarsi whitish yellow except at the extreme apex and some having the upper portion of the propleuræ fusco-ferruginous. A specimen from Hobart differs in having the hind metatarsus black and the second abscissa of the radius nearly half as long again as the second transverse cubital nervure.

Austrohelcon erythrocephalus, sp. n.

♂. Rufo-testacea; thorace nigro, propleuris supra ferrugineis; segmento mediano nigro-suffuso; tibiis posticis tertio apicali, metatarso postico dimidio basali, unguiculisque nigris; antennis

43-articulatis, articulis 15-25 albido-flavis; terebræ valvulis nigris; alis hyalinis, venis fuscis, tegulis testaceis.
Long. 9 mm.; terebræ long. 10 mm.

♀. Differs from *A. meridionalis* in having the face very finely punctured, without a carina; the median lobe of the mesonotum finely punctured, not reticulate posteriorly; the first tergite transversely rugulose, the two longitudinal carinae stronger than in *meridionalis* and reaching almost to the apex, and the second cubital cell longer, somewhat narrowed to the apex, the second abscissa of the radius nearly twice as long as the second transverse cubital nervure, and about two-thirds of the length of the cubital margin of the cell.

Hab. Victoria (C. French).

A specimen from Franklin, Tasmania, has the hind tarsi whitish-yellow except at the base and apex, but in the type also they are much paler than the other tarsi, and would probably be whitish yellow in life.

I have not seen either *A. indultor*, Erichs., or *A. australianus*, Kokuji. A specimen of *A. inornatus*, Kokuji, differs from the type in having joints 15-21 of the antennæ whitish instead of 15-24 as in the type, and the antennæ only 39-jointed instead of 45; but another specimen has 41 joints with joints 15-22 whitish. The female of *inornatus* has the terebra equal in length to the whole insect. Probably, as Kokuyew suggests, *inornatus* will prove to be a variety of *indultor*. The three species of *Austrohelcon* known to me all have the clypeus short and the labrum exposed.

TRICHELCON, gen. nov.

♀. Closely allied to *Austrohelcon*, differing in the deeper frontal excavation, in the strong longitudinal median carina of the second tergite, and in the dense hairy covering of the median segment and of the first and second tergites.

Type of the genus, *Iphiaulæ phoracanthæ*, Frogg.

Trichelcon phoracanthæ, Frogg.

Iphiaulæ phoracanthæ, Frogg. *Agricult. Gazette of New South Wales*, xxvii. p. 505 (1916). ♀.

♀. Nigra; capite rufis; segmento mediano, tergitisque primo secundoque albo-cinereo-hirsutis; alis fusco-hyalinis, venis nigris.
Long. 11 mm.; terebræ long. 11 mm.

♀. Antennæ 48-jointed; head shining, the face finely

punctured; clypeus short, the anterior margin straight, not reaching the mandibles, labrum exposed. Mesonotum and pleuræ shining, smooth, the median lobe of the mesonotum prominent, parapsidal furrows deep. First tergite less than twice as long as its apical breadth.

Hab. S.E. Australia and Tasmania.

A parasite on *Phoracantha* larvæ. Placed in *Iphiaulax* by Froggatt on the determination of C. Morley.

Genus GYMNOSELUS, Först.

Gymnoscelus rufoniger, sp. n.

♀. Nigra, capite thoraceque rufis; antennis, postscutelloque nigris; segmento mediano nigro, denso albido-piloso; coxis anticis rufis; alis fusco-hyalinis, venis fuscis; antennis 45-articulatis. Long. 10 mm.; terebræ long. 8 mm.

♀. Head broader than the thorax, smooth and shining, the face very minutely punctured. Clypeus truncate at the apex, the labrum slightly exposed; cheeks long, only a little shorter than the eyes; frontal excavation deep. Thorax smooth and shining, the median lobe of the mesonotum rather prominent; parapsidal furrows well marked, very finely crenulated in the middle, the extremities smooth; a curved and strongly longitudinally striated depression at the base of the scutellum. Median segment densely covered with whitish hairs, not areolate. Abdomen smooth and shining, not quite as long as the head, thorax, and median segment combined, fusiform; the first tergite about half as long again as its apical breadth, covered with close-lying white hairs, not emarginated. Hind coxæ subopaque, closely and minutely punctured, sparsely covered with white hairs. First discoidal cell sessile, nervulus slightly postfural, anal cell of fore wing with two transverse nervuli, the second partly obsolete. First abscissa of the radius very short, second half as long again as the second transverse cubital nervus, the latter straight, forming a right angle with the cubitus.

Hab. Hobart, Tasmania (*J. J. Walker*); Victoria (*French*).

In the Victorian specimen the white hairs spread on to the sides of the second tergite. The species is not a typical *Gymnoscelus*, differing in the shape of the second cubital cell and in the partial effacement of the second transverse vein of the anal cell. It forms a link between *Gymnoscelus* and *Trichoselcon*, differing from the latter in the absence of a

carina on the second tergite and the partial development of the second transverse vein of the anal cell.

Gymnoscelus rufithorax, sp. n.

♂. Gracilis, niger; thorace rufo; segmento mediano nigro, rugoso; alis hyalinis, venis fuscis; antennis 32-articulatis; tarsis intermedii articulis tertio quartoque pallide brunneis.

Long. 6 mm.

♂. Head broader than the thorax, finely and closely punctured, the face more closely punctured than the vertex and clothed with short white pubescence; clypeus truncate at the apex; cheeks about half as long as the eyes; frontal excavation very shallow and ill-defined, a low carina from between the antennæ to the anterior ocellus. Thorax finely and closely punctured; the median lobe of the mesonotum not prominent; parapsidal furrows clearly defined, finely crenulated. Basal half of the scutellum depressed and strongly longitudinally striated; median segment very coarsely rugose, not areolate. Abdomen very slender, as long as the head, thorax, and median segment combined; the first tergite nearly as long as the remainder of the abdomen, gradually broadened from the base, three times as long as its apical breadth, transversely rugulose, with two longitudinal carinæ from the base extending for fully three-quarters of the length of the tergite, the extreme apex smooth and shining. Hind coxæ closely and finely punctured and sparsely clothed with white hairs, hind calcaria very short. First discoidal cell sessile, anal cell with two transverse nervures; second abscissa of the radius nearly twice as long as the first, equal in length to the second transverse cubital nervure, only half as long as the cubital margin of the cell; second transverse cubital nervure straight, forming a right angle with the cubitus.

Hab. Melbourne, Victoria (French).

This differs from typical *Gymnoscelus* in the very shallow and almost obsolete frontal excavation, in which point it approaches *Aspidocolpus*. But the second transverse vein in the anal cell is present as in *Gymnoscelus*.

Genus *ASPIDOCOLPUS*, Wesm.

Aspidocolpus penetrator, Sm.

Rhogas penetrator, Sm. Trans. Ent. Soc. London, p. 5 (1878). ♀.

This was erroneously placed in *Rhogas* by Smith. The

head is smaller and more transverse than is usual in the Helconinae, and the abdomen is placed lower on the median segment, almost as low as in the Diapriinae, to which subfamily the species shows some approach; but the abdomen is long and slender, and I think it is best placed here.

Hab. New Zealand.

Genus BRULLEIA, Szépl.

Brulleia chinensis, sp. n.

♂. Rostrum oesophageous; flagello, articulo basali excepto, mandibulis apice, abdomine segmentis tertio, basi excepto, sequentibusque, tibiis posticis dimidio apicali, tarsisque posticis, articulo apicali excepto, nigris; alis flavo-hyalinis, venis ferrugineis, stigmatibus costisque nigris.

Long. 20 mm.

♂. Mandibles bidentate at the apex, the upper tooth distinctly longer than the lower; clypeus short, truncate at the apex, the labrum exposed. Head transverse, broader than the thorax, the whole, including the labrum, very finely and closely punctured; frontal excavation not very deep, but well defined; eyes about three times as long as the cheeks. Antennae long, broken at the apex beyond the thirty-sixth joint. Thorax finely and closely punctured; middle lobe of the mesonotum not prominent; parapsidal furrows deep, crenulated; postscutellum distantly longitudinally striated. Median segment rugose, with an indistinct semicircular basal area and two indistinct longitudinal carinae very close together near the middle; these carinae diverge on the apical slope, enclosing a small semicircular area; the lateral margins of the segment with strong carinae, the spiracles large and oval; a longitudinal striated groove below the spiracles. First tergite rugose, broadened from the base, three times as long as its apical breadth, with a longitudinal carina running from each of the basal angles nearly to the middle; second tergite finely punctured-rugulose in the middle, the remainder of the abdomen very finely and closely punctured. Hind metatarsus as long as the four apical tarsal joints combined. Anal cell with two transverse nervures. First discoidal cell sessile; recurrent nervure received by the second cubital cell near the base; second abscissa of the radius nearly twice as long as the first, fully as long as the second transverse cubital nervure, which is oblique, but not bent; nervulus interstitial.

Hab. North China.

The type of the genus is from New Guinea, but this appears to be congeneric.

Genus *HELCON*, Nees.

Helcon unicornis, sp. n.

♀. Nigra; mandibulis basi, coxis trochanteribusque posticis, femoribusque posticis, apice nigro excepto, ferrugineis; tegulis, palpis, segmento abdominali primo, pedibusque anticis intermediisque testaceo-ferrugineis; tarsis posticis, articulo apicali excepto, albidis; antennis 37-articulatis, articulis 10 basilibus fusco-brunneis, 11-18 albis, apicalibus nigris; alis hyalinis, venis fuscis.

Long. 9 mm.; terebræ long. 6 mm.

♀. Face rugose, with a few oblique striæ on each side; vertex and front smooth and shining; the frontal depression not very deep, but strongly margined laterally, from the anterior portion of the depression rises a strong blunt horn, which rises higher than the raised lateral margins of the depression. Cheeks more than half as long as the eyes. Thorax closely and rather finely punctured; median lobe of the mesonotum not prominent; parapsidal furrows crenulated; mesopleuræ smooth and shining; the mesonotum behind with distinct transverse striæ in the middle; basal half of the scutellum occupied by a deep longitudinally striated depression. Median segment transversely rugulose, with four strong longitudinal carinae on the dorsal surface, the sides of the segment rugose-reticulate. First tergite rather coarsely punctured-rugulose, a little more than twice as long as its apical breadth; second tergite indistinctly punctured-rugulose at the base, shining at the apex; the apical tergites smooth and shining. Hind femora very finely serrate in the middle beneath, with a stout spine beneath before the apex. The second transverse nervure in the anal cell of the fore wing is only faintly indicated. First discoidal cell distinctly petiolate; second abacissa of the radius less than twice as long as the first, as long as the second transverse cubital nervure, less than half as long as the cubital margin of the cell; second transverse cubital nervure oblique; nervulus slightly postfural.

Hab. French Indo-China (received from A. Vuillet).

The frontal excavation is smaller than is usual in the genus, and does not extend as high as the anterior ocellus, differing in this respect from the Japanese *H. cornutus*, Cam., in which the excavation is very large and deep.

African gazelles—*G. granti*, *sæmmeringii*, and *dama*—connect the smaller typical African and Asiatic gazelles with the springbuck *Antidorcas*; and Lydekker and Blaine (Cat. Ung. Mamm. iii. p. 85, 1914) adopt for them the subgeneric title *Nanger*, remarking that the group is replaced in South Africa by *Antidorcas*. Although I am only acquainted with the normal pedal glands of *G. granti*, I am unable to find in *G. sæmmeringii* and *G. dama* any justification for the view that they lessen the differences between the typical gazelle and *Antidorcas*, or that they represent the latter in north and east Africa more nearly than the other gazelles of the area represent it.

In the same Catalogue another subgenus of gazelles is admitted under the name *Procapra*, comprising the three central Asiatic gazelles *picticaudata*, *przewalskii*, and *gutturosa*, none of which is known to me apart from dried skins and skulls.

Procapra was established by Hodgson for the reception of *picticaudata*, which, according to his description, differs from other gazelles in having no preorbital, inguinal, or carpal glands; no trace of moist rhinarium, and the interdigital fossæ, described in one place as "pores," small. Moreover, on the positive side it possesses a large postorbital sinus, by which is meant apparently a gland behind the horns analogous to that of *Rupicapra* and *Oreamnos*. Admitting the truth of these observations, and I do not see on what grounds they are to be disputed, *picticaudata* must be recognized as generically distinct from *Gazella*, and *przewalskii*, which at least resembles it in the absence of preorbital, inguinal, and carpal glands, must be associated with it—at all events, provisionally. The species named *gutturosa*, on the other hand, resembles the typical gazelles in having preorbital, carpal, and inguinal glands, the first two being small and the last-mentioned large. Clearly, therefore, it must be severed from *picticaudata* and *przewalskii*, for which the name *Procapra* must be retained. But, according to Pallas, *gutturosa* possesses a preputial glandular sack, recalling that of *Moschus*, *Nototragus*, and *Sus*. In this respect it differs, so far as is known, from all the species of *Gazella*. I propose, therefore, to dismember *gutturosa* from *Gazella* under the generic title *Prodorcas*.

Genus ANTIDORCAS, Sund.

Antidorcas marsupialis, Zimm. (p. 893).

Several fresh examples of this species confirm in every

Genus Cœlostephanus, Kieff.

Cœlostephanus, Kieff. Ann. Soc. Entom. France, p. 232 (1911).

This genus, created by Kieffer for the Mexican *C. rufus*, Kieff., must sink as a synonym of *Gymnoscelus*. The hind femora are missing in the type. The first tergite is smooth, and the second transverse cubital nervure is not oblique; otherwise it does not differ appreciably from *Gymnoscelus*. Kieffer placed his genus in the Stephanidæ, quite erroneously.

XVIII.—Contributions to a further Knowledge of the Rhynchotal Family Lygæidæ. By W. L. DISTANT.

[Continued from vol. i. (ser. 9) p. 424.]

Æthalotus apicimaculatus, sp. n.

Head, pronotum, scutellum, and corium black, finely, more palely pilose; bases of the pedunculated eyes and narrow base of head, an obscure narrow central line to pronotum, an apical spot to scutellum, connexivum, lateral areas of head beneath, broad lateral margins to sternum, and body beneath more or less dark ochraceous; legs, rostrum, and antennæ black; antennæ with the second joint longer than the third, which is almost subequal in length to fourth joint; eyes strongly pedunculate; the pale apex to the scutellum somewhat globose; pronotum finely, obscurely punctate; membrane slaty grey, the veins black, not reaching abdominal apex.

Long. 5 mm.

Hab. East Africa [German]; Lulanguru (G. O. H. Carpenter).

Lygeus montislunæ.

Spilostethus montislunæ, Bergr. Rev. Zool. Afric. iii. p. 456 (1914).

This species originally described from Uganda has also been received by the British Museum from Abyssinia; Managasha (*P. C. Zaphiro*).

Lygeus fimbriatus.

Lygeus fimbriatus, Dall. List. Hem. ii. p. 546 (1852); Dist. Faun. Brit. Ind., Rhynch. ii. p. 7 (1904).

This species has now been received from Ceylon; Peradeniya.

Lygeus negus, sp. n.

Sanguineous; apex of head and a spot at inner margins of eyes, anterior margin of pronotum and two large subquadrate spots on disk not quite reaching posterior margin and anteriorly, outwardly, narrowly connected with lateral margins, scutellum (excluding apex), posterior half of clavus, lateral margins, and a central rounded spot connected with the same black; body beneath sanguineous, posterior sternal areas greyish white and laterally spotted with black; antennæ, legs, and lateral margins of abdomen black; antennæ with the second joint longest, third and fourth almost subequal in length; pronotum centrally longitudinally carinate; scutellum robustly carinate on apical half; membrane passing abdominal apex, fuliginous, the veins on extreme basal area black.

Long. 8 mm.

Hab. Abyssinia; Higo Samula (*R. J. Stordy*).

Allied to *L. beltoni*, Dist., from Brit. E. Africa.

Lygeus dives, sp. n.

Ochraceous; apex of head and a large spot at inner margin of each eye, pronotum with the anterior marginal area and two large subquadrate spots (anteriorly nearly united to each other centrally and to the lateral margins perfectly), scutellum (excluding a; ex), corium with the outer claval margin and a dark r spot at inner claval apex, lateral margin (not extending to apex), a darker spot near middle of lateral area, membrane, rostrum, and legs black; head beneath and sternum black, margins of the sternal segments greyish white, a prominent ochraceous spot near lateral margins of each segment, and a few darker black spots; abdomen beneath dull testaceous with a broad central fascia and narrow lateral margins black; antennæ mutilated; black markings above more or less obscurely punctate; an oblique incision on each side of the anterior pronotal area between the black markings; rostrum reaching the posterior coxæ.

Long. 7 mm.

Hab. Uganda; Mutanda (*C. H. Marshall*).

Allied to the preceding species, *L. negus*, Dist.

Graptostethus pictus, Dist. (*Ann. & Mag. Nat. Hist.* (7) vii. p. 538, 1901).

This species, formerly only known from Natal and Transvaal, can now be also recorded from N.E. Rhodesia; Upper

Luangwa R. (S. A. Neave). East Africa [German] Bd. to Kilossa, Usagara Dist. (S. A. Neave).

Graptostethus carpenteri, sp. n.

Head and antennae black; pronotum testaceous with a large basal black spot at each posterior angle; scutellum black; corium greyish ochraceous, an elongate black spot on apical half of clavus and a central rounded black spot abutting on middle of costal margin; membrane black with a transverse spot attenuated interiorly and a somewhat large apical spot greyish white; connexivum ochraceous with black spots; body beneath pale purplish red, coxal areas paler and more greyish in hue; head beneath, rostrum, legs, two sternal spots on each lateral margin, small lateral abdominal segmental spots, and the apical abdominal segment black; antennae with the second, third, and fourth joints almost subequal in length; scutellum longitudinally carinate on apical half; membrane passing abdominal apex.

Long. 4½–5 mm.

Hab. East Africa [German], Lulanguru (G. D. H. Carpenter).

Allied to *G. pictus*, Dist.

Graptostethus flammatus, sp. n.

Testaceous red; apex of head and a small spot at inner margin of each eye, pronotum with the anterior marginal area and a large spot on each side of disk, scutellum (excluding apical central carination), corium with the clavus, internal area and a sublateral marginal spot beyond middle, membrane, body beneath, rostrum, antennae, and legs black; lateral margins of sternum and abdomen and abdominal disk more or less testaceous; sternal and coxal margins greyish white; antennae with the second joint about three times as long as the first; head and pronotum more or less obscurely punctate; basal angles of pronotum moderately rounded, the lateral margins moderately thickened and slightly recurved; scutellum prominently centrally carinate.

Long. 12 mm.

Hab. Uganda; Kampala (C. C. Gourdey and S. A. Neave).

A species somewhat superficially resembling above the well-known palaearctic *Lygaeus familiaris*, Fabr.

Graptostethus swynnertoni.

Lygaeus swynnertoni, Dist. Ann. Mag. Nat. Hist. (8)* xv. p. 504 (1915).

The typical specimen described did not afford me a good

opportunity of detecting the posteriorly obliquely truncate metapleuræ. I have now had the opportunity of examining a good series of specimens.

Hab. South Rhodesia (C. F. M. Swynnerton). Gaza Land; nr. Chirindi Forest (G. A. K. Marshall). Nyasaland; Mlanje (S. A. Neave).

The British Museum also now possesses a specimen labelled "near Sfax, Tunis (*de Boerio*)," a locality which I consider doubtful.

Pyrrhobaphus guttaticollis, sp. n.

Dull purplish red, more or less pale ochraceously or greyishly pilose; eyes black; pronotum with the anterior marginal area piceous and containing two dark black spots, two somewhat similar spots in transverse series on pronotal disk, and two larger and somewhat subquadrate spots at base, scutellum and membrane black, the latter with its basal angle and apical margin greyish white; body beneath thickly greyishly pilose, sternal and abdominal segments with prominent lateral black spots; legs black, greyishly pilose; antennæ with the basal joint ochraceous and its extreme base sanguineous, remaining joints black, extreme base of second joint ochraceous, second joint a little longest, third and fourth almost subequal: anterior marginal area of pronotum posteriorly defined by a waved, obliquely rounded incised black line; scutellum more thickly pilose, with a T-shaped discal carination; rostrum black.

Long. 1.1 mm.

Hab. Malay Archipelago; Damma Isld. (J. J. Walker).

Cynocoris torridus, sp. n.

Above dull testaceous red; antennæ, eyes, anterior area of pronotum (excluding extreme anterior margin), scutellum (excluding apex), and membrane black or blackish; sternum pale sanguineous with large coxal blackish spots; abdomen beneath dull ochraceous, the discal posterior areas of the segments black; rostrum, legs, and antennæ black; fourth joint of antennæ considerably longest, second and third almost equal in length; head above discally convex; pronotum coarsely punctate; scutellum centrally longitudinally carinate, the carination not reaching base, its apex sanguineous; clavus rather more very dull greyish than remainder of corium; membrane with the basal angle dark indigo-blue, its apical margin hyaline; rostrum reaching apical margin of second abdominal segment.

Long. 11-18 mm.

Hab. Queensland; Townsville (F. P. Dodd). Cooktown (Philip de la Garde).

Cænocoris floridulus, sp. n.

Head, pronotum, scutellum, and corium bright sanguineous; membrane, antennæ, rostrum, and legs (including coxæ) black; head beneath, lateral areas of sternum, and the abdomen beneath sanguineous, the stigmatal spots more or less black; basal joint of antennæ reddish ochraceous, apical joint about as long as second and third joints together; pronotum very coarsely punctate; scutellum strongly, centrally, longitudinally carinate, the carination not reaching base; membrane somewhat bluish black, its extreme basal angle testaceous, its apical margin subhyaline; rostrum very long, almost or quite reaching the apical abdominal segment.

Long. 18-20 mm.

Hab. Indo-China; Tonkin, Laos, Vientiane (R. F. de Salva).

Allied to *C. augur*, Stål, from Queensland.

Macropes albosignatus, sp. n.

Black; a large subquadrate spot on each lateral margin of corium, a subbasal transverse arcuated fascia and a broad apical fascia to membrane greyish white; basal joint of antennæ ochraceous (remainder mutilated); anterior lobe and base of posterior lobe of pronotum shining black, and sparsely punctate, the intermediate area opaque and thickly coarsely punctate, on the anterior lobe are two discal foveate impressions, posterior pronotal margin concavely sinuate before base of scutellum which is longitudinally carinate; membrane almost reaching base of penultimate abdominal segment.

Long. $9\frac{1}{2}$ mm.

Hab. N.E. Rhodesia; near Petauke, 200-400 feet (S. A. Neave).

This fine species is represented by a somewhat strongly carded specimen, so that it is not possible to describe the under surface. It is allied to *M. sultanus*, Dist., from Zanzibar.

Macropes nigrolineatus, sp. n.

Ochraceous; three lineate, longitudinal spots between eyes, narrow anterior margin, and two large spots at basal margin of pronotum, inner claval margin, a transverse macular fascia near middle of clavus, a submarginal narrow longitudinal fascia, and an apical central line to abdomen above—visible through the transparent tegmina—black; body beneath imperfectly seen in carded type; antennæ ochraceous, apical joint claviform, scarcely longer than the preceding joint; head and pronotum coarsely punctate; scutellum finely centrally longitudinally carinate; corium somewhat finely punctate; anterior femora incrassated and spined beneath.

Long. 5 mm.

Hab. East Africa [German]; Lulanguru, 17 miles W. of Tabora—on bushes (*G. D. H. Carpenter*).

Germalus humeralis, sp. n.

Ochraceous; pronotum (excluding anterior marginal area), clavus, outer claval area, and pale suffusion at base of membrane pale bluish-grey; eyes castaneous, inclining to sanguineous; body beneath and legs pale ochraceous, abdomen beneath with a sublateral, sanguineous, linear fascia; antennæ ochraceous, the first and fourth joints darker, second joint longer than either third or fourth; head above with an oblique dark line from ocelli to eyes and in some specimens a cruciform dark spot on its apical area; pronotum with an anterior submarginal transverse series of punctures, the bluish-grey area coarsely punctate, the posterior angles distinctly black and subnodulose; scutellum coarsely and prominently carinate, obliquely from each basal angle to before middle and thence longitudinally to apex, the non-carinate portion punctate, and sometimes more or less testaceous; corium with the lateral margin pale and impunctate; membrane hyaline reflecting the testaceous abdomen beneath which has also a central longitudinal dark fascia.

Long. $4\frac{1}{2}$ –5 mm.

Hab. Queensland; Townsville (*F. D. Dodd*).

Germalus coloratus, sp. n.

Head ochraceous with three black spots—one near apex, and one before each eye; eyes purplish red; pronotum

bluish-grey, coarsely darkly punctate, two slightly oblique, impunctate, ochraceous spots in transverse series on apical area, the posterior angles prominently black; scutellum bluish-grey, prominently, cruciately, ochraceously carinate; corium subhyaline with its apical margin black, reflecting the dark abdomen beneath which is black, and with the lateral margins and some central spots dark ochraceous; body beneath and legs ochraceous; antennæ pale ochraceous, the apical joint darkest, shorter than the second, but longer than the third.

Long. 5 mm.

Hab. Queensland; Kuranda (T. P. Dodd).

BIBLIOGRAPHICAL NOTICE.

Report on Cetacea stranded on the British Coasts during 1917.

With 3 text-figures and 1 map. By S. F. HARMEN, Sc.D., F.R.S.,
Keeper of the Department of Zoology. London: printed by
Order of the Trustees of the British Museum. 1918.

THIS Report, the fifth in succession, records the stranding during the year 1917 of 31 Cetaceans, belonging to at least 12 species, on the coasts of the British Islands. Several of these are of quite exceptional interest, and the male cachalot (*Physeter catodon*), nearly 60 feet in length, which was found floating dead in the Moray Firth and towed to the Caithness coast by a patrol boat, heads the list in point of size. Other noteworthy records are those of the rare northern white-sided dolphin (*Lagenorhynchus acutus*) from Skegness, Lincs, observed for the first time in English waters; the equally rare Risso's grampus (*G. rissoi*) and Cuvier's beaked whale (*Ziphius cavirostris*) from the coasts of South Devon and Clare respectively; and the large rorqual, probably *Balenoptera physalus*, from the Scilly Islands. An interesting summary of the occurrence and distribution of the commercially valuable bottle-nosed whale (*Hyperoodon rostratus*) in British waters appears on p. 16. Although some of the animals were, when found, in very bad condition, it is satisfactory to learn that in many cases it was found possible to preserve the jaws and other hard parts for identification and future reference; and due acknowledgment is given to the assistance of the coastguard and other authorities in these observations, in the midst of more exacting duties.

PROCEEDINGS OF LEARNED SOCIETIES.

GEOLOGICAL SOCIETY.

June 6th, 1918.—Mr. G. W. Lamplugh, F.R.S.,
President, in the Chair.

The following communication was read:—

‘The Kelestominæ, a Sub-Family of Cretaceous Cribrimorph Polyzoa.’ By William Dickson Lang, M.A., F.G.S.

The Kelestominæ are a sub-family of Pelmatozoidæ. The latter are a family of Cretaceous cribrimorph Polyzoa, whose costæ are prolonged upwards as hollow spines from the median area of fusion of the intraterminal front-wall. The broken ends of these spines form a row of pelmata (or, if small, pematidia) on the intraterminal front-wall.

The Kelestominæ are Pelmatozoidæ with an apertural bar each half of which is bifid; and the proximal and distal forks of each half are fused with the corresponding forks of the other half. The fused distal forks are also fused with the proximal pair of apertural spines, which are greatly enlarged.

The simplest known form of this arrangement is seen in the genus *Kelestoma* Marsson. *Kelestoma* is characterized among the Kelestominæ by its great axial length, and by the great number of costæ. *Kelestoma* has the following three species, which form a single lineage:—(1) *Kelestoma elongatum* Marsson, with an incrusting asty; (2) a new species, with a bilaminar, erect asty; (3) *K. scalare* Lang, with an erect, cylindrical asty. There is, in this series, a slight catagenetic decrease in the number of costæ, and the avicularian aperture becomes somewhat more pointed. The genus occurs in the Senonian, zone of *Belemnitella mucronata*, in the island of Rügen.

Morphasmopora, unlike *Kelestoma*, retains a small number of costæ and a short acium; but the thickness of the proximal apertural spines, which are hardly recognizable as such, is enormously increased; the thickness of the bifid apertural bar is also increased. In *Morphasmopora brydonei* Lang, there are four circum-apertural avicularia; and the proximal apertural spines and the apertural bar, though enormously developed, are not so large as in *M. jukes-brownei* (Brydone). The latter species has fewer costæ than the former, and but one pair of circum-apertural avicularia. There are also differences in the interaxial and interstitial secondary tissue of the two species. *M. brydonei* occurs in the island of Rügen and *M. jukes-brownei* at Trinningham; both from the Senonian, zone of *Belemnitella mucronata*.

respect the constancy of the characters established in 1910, showing that, so far as the cutaneous glands are concerned, the genus *Antidorcas* differs from *Gazella* in the absence of inguinal and carpal glands and the presence of the great dorsal gland.

I may add that the rhinarium resembles that of *Gazella* in consisting of a small irregularly pentagonal area on the nasal septum, and that the penis is also like that of *Gazella*, the urethral canal projecting a short way beyond the tip of the slightly swollen glans (fig. 1, E).

Genus *ANTILOPE*, Pall.

Antilope cervicapra, Linn. (p. 894).

My observations upon the cutaneous glands of this antelope were based in 1910 upon two dried skins. Since that date I have seen several fresh specimens, confirming in all respects the characters previously established as distinguishing the genus *Antilope* from *Gazella*. Two other differences are, however, supplied by the rhinarium and the penis. The rhinarium (fig. 1, K, L) is considerably better developed, and therefore less specialised than in *Gazella* and *Antidorcas*. Not only is it broader between the nostrils, but it is extended along their upper border nearly as far back as their posterior notch.

In the penis, figured by Lönnberg in 1904, the urethral prolongation is longer and thicker than in *Gazella* and *Antidorcas* (fig. 1, A).

Genus *LITHOCRANIUS*, Kohl.

Lithocranius walleri, Brooke (p. 896).

I am indebted to the late Mr. F. C. Selous for the fore and hind feet and the skin of the inguinal area of this species from British East Africa. These show that the foot I examined and described in 1910 was, as suggested, distorted with respect to the glandular interdigital space. This space (fig. 1, F) differs from that of *Gazella*, *Antidorcas*, and *Antilope* in that it gradually deepens from its upper (or proximal) to its lower (or distal) end, where the thick interungual fold curves forward. In other words, the skin of the front of the pastern above the depression passes imperceptibly into the latter by a gradual inclination, without showing a sign of the abrupt descent seen in the other genera. The pedal gland recalls that of *Rupicapra*.

There are two pairs of mammae, but no inguinal glands.

By their external characters, dealt with in this paper, and by their horns the genera of Antilopinae here admitted may be briefly diagnosed as follows :—

Genus GAZELLA, Licht.

Preorbital, inguinal, carpal, and pedal glands present, the pedal glands in the form of long and deep interdigital clefts of even depth throughout; rhinarium a small irregularly pentagonal moist area on the narial septum, and not, or only to a very small extent, bordering the nostrils above; urethral canal usually only surpassing the glans penis to a small extent; horns in males with concavo-convex, usually sigmoid, curvature.

Type, *G. subgutturosa*.

Distribution. From Central and South-western Asia into India and North and East Africa.

Far too many species of this genus appear to me to be admitted by Lydekker in the British Museum Catalogue.

Genus PRODOBCAS, nov.

Distinguishable from *Gazella* by the presence of a preputial gland and a shorter tail, the structure of the pedal glands being unknown.

Type, *P. gutturosa*, Pall.

Distribution. Mongolia and Northern China.

Genus ANTILOPE, Pallas.

Distinguishable from *Gazella* by the nakedness of the integumental web tying the hoofs together, by the larger rhinarium which borders the nostrils above, by the much longer and thicker elongation of the urethral canal of the glans penis, and by the spirally twisted horns.

Type, *A. cervicapra*.

Distribution. India.

Genus ANTIDORCAS, Sund.

Distinguishable from *Gazella* by the absence of inguinal and carpal glands and by the presence of a large distensible glandular area on the back, which is peculiar to the genus.

Type, *A. marsupialis*, Zimm.

Distribution. Africa south of the Zambesi.

Genus LITHOCRANIUS, Kohl.

Distinguishable from *Gazella* by the structure of the pedal glands, the floor of which gradually slopes downwards from the front of the fetlock, the cleft being deepest at its lower end, where it is walled in by the heel-tie; also by the absence of inguinal glands and the presence of four mammaræ.

Type, *L. walleri*.

Distribution. British East Africa and Somaliland.

Genus PROCAPRA, Hodgson.

Distinguishable from *Gazella* by the absence of the pre-orbital, inguinal, and carpal glands, the presence of a gland behind the horns, the reduced size of the pedal glands which apparently have a pore-like orifice, as in *Ovis* and *Nemorhedus*, and, it is stated, by the rhinarium being overgrown with hair.

Type, *P. picticaudata*, Hodgs.

Distribution. Mongolia, China, Tibet.

Subfamily RUPICAPRINÆ.

Genus RUPICAPRA, Blainv.

Rupicapra rupicapra, Linn. (p. 818).

Several examples of the typical race of this species from the Tyrol have enabled me to verify, and in the case of some characters to extend, my observations, which in 1910 were based upon the carcasses of two newly born kids and upon adult specimens living in the Zoological Gardens.

Preorbital and *inguinal glands* are absent and the structure of the *pedal glands* is constant, the floor of the depression slopes gradually downwards from the front of the fetlock to the heel-tie, where the integument is folded forwards and upwards to form a ridge constituting the distal well of the depression. The walls of the depression are covered with soft, short, silky hair. Elsewhere the hair of the foot is long and coarse, and it is noticeable that the space between the hoofs and the heel-tie itself are covered with long hair. In this character the feet of *Rupicapra* differ from those of other genera of Rupicaprinæ. Even in *Oreamnos*, where the greater part of the interdigital cleft is hairy, the heel-tie at least is naked*.

* My figure of the foot of the newly born chamois shows the point of the heel-tie to be naked. I am, unfortunately, unable to verify the accuracy of the drawing in that respect.